SNEAK PREVIEW: PRE-COMDEX ROUNDUP

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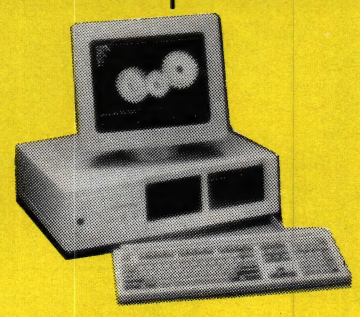

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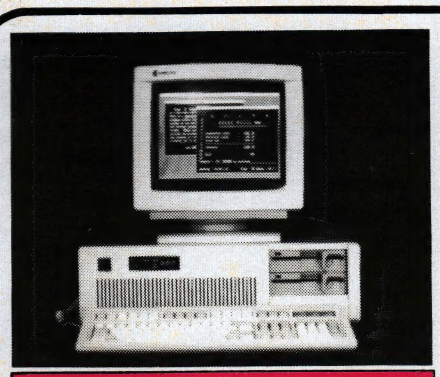

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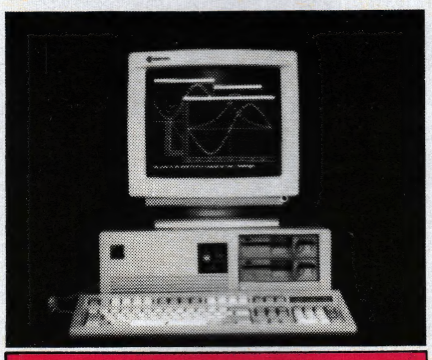

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- 200W POWER SUPPLY
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- ONE PARALLEL, ONE SERIAL, ONE GAME, REAL TIME CLOCK
- AT CASE
- ENHANCED 101-KEY w/TACTILE FEEL KEYBOARD
- OPERATIONS MANUAL
- ONE YEAR WARRANTY

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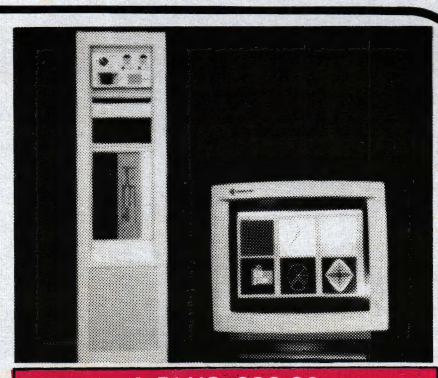
40MB (40MS)	Add: $ 365
40MB (28MS)	Add: $ 455
80MB (28MS)	Add: $ 650



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- OPERATIONS MANUAL
- ONE YEAR WARRANTY

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HARD DRIVES SUBSYSTEM	
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STI 88-10

Standard Features:

- Intel 8088-1 CPU
- 512K Memory 120NS, Expandable to 1MB
- Dual Speed 4.77/10 MHZ
- Landmark 4.1 MHZ
- 150WT UL Power Supply
- Eight Expansion Slots
- One 360K Floppy Drive
- 1 Parallel, 1 Serial, 1 Game, Clock
- 84-Key Tactile/Feel Keyboard
- 8088 Turbo Case
- Operations Manual
- One Year Warranty

MONO SYSTEM	$ 645	**HARD OPTIONS:**	
RGB SYSTEM	$ 819	**20MB**	**$259**
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STI 286-10B

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- Intel 80286-10 CPU
- 512K Memory 100NS, Expandable to 1MB
- Dual Speed 8/10 MHZ, 0 Wait State
- Landmark 13.2 MHZ
- Eight Expansion Slots
- 180WT Baby Power Supply
- One 1.2MB Floppy Drive
- Dual Floppy and Hard Disk Controller
- 1 Parallel, 2 Serials, 1 Game, Clock
- Enhanced 101-Key Tactile/Click Keyboard
- Baby 286 Turbo Case
- Operations Manual
- One Year Warranty

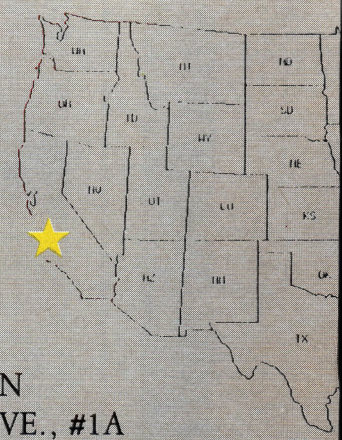
$$ See Price Table $$

STI 386 TOWER

Standard Features:

- Intel 80386 CPU, 32 BIT Architecture
- 1MB RAM 80NS, Expandable to 2MB
- 16 MHZ (Landmark 20 MHZ)
- 20 MHZ (Landmark 25 MHZ)
- Five 16 BIT Slots, Two 8 BIT Slots
- One 32 BIT Memory Slot, Up to 10MB
- 8 or 10 MHZ 80287 CO-PROCESSOR Socket
- Real Time Clock, 80387 Adapter Board as an Option
- 200WT UL Power Supply (Tower System: 250WT)
- Enhanced 101-Key with Tactile/Click Keyboard
- Dual Floppy/Hard Disk Controller
- One 1.2 Floppy Drive
- One Parallel, Two Serial Ports, Game Port
- One Year Warranty, Operations Manual

STI



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MONO SYSTEM WITH 15" FLAT SCREEN	$1070	1080	1180	2045
RGB SYSTEM WITH 14" MONITOR	$1180	1190	1290	N/A
EGA SYSTEM WITH 14" MONITOR	$1395	1405	1505	2400
VGA SYSTEM WITH 14" MONITOR	$1620	1630	1730	2695
MULTI-FREQ. SYSTEM 14" MONITOR	$1635	1645	1745	2720

** **CALL FOR 286-16 SYSTEM PRICE/INFORMATION**

STI 386 Options Available:

- 80387 Adapter Board $ 85
- 20 MHZ Option $250
- Tower Case/250W Power $200

MONITORS

- SAMSUNG, AMBER, 12", TTL ..... $ 75
  SWIVEL BASE, 720 x 350, 80 x 25
- TATUNG CM-1495, 14" MULTI-FREQ. 520
  800 x 560, TILT/SWIVEL

QUIMAX

- DM-14, HIGH RES, MONOCHROME MONITOR 119
  14", 750 x 350, 132 COLUMNS x 44 LINES
- DM-15, 15" AMBER, FLAT, 750 x 350, 1000 LINES .. 135
- DM-1502, RGB 640 x 240, 14" 250
- DM-2214, EGA MONITOR, 720 x 350 360
  64 COLORS
- DM-3112, 12" VGA, 480 x 720 360
- DM-3114, 14" VGA, 480 x 720 445

SYSTEM BOARDS

8088 BASE CPU:

- 4.77/8 MHZ TURBO BOARD ..... $ 82
- 4.77/10 MHZ TURBO BOARD 85

80286 CPU:

- 8/10 MHZ TURBO BOARD (BABY SIZE) 257
- 6/10 MHZ TURBO BOARD (FULL SIZE) 257
- 6/12 MHZ TURBO BOARD (FULL SIZE) 310

80386 CPU:

- 4.77/6/8/16 MHZ BOARD 1490
- 4.77/6/8/20 MHZ BOARD 1790

All System Boards Include either Phoenix or Award BIOS

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- MONOGRAPHIC WITH PRINTER PORT ..... $ 49
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  WITH PRINTER PORT
- COLOR GRAPHIC WITH PRINTER PORT 43
- MONOCHROME/COLOR GRAPHIC CARD 62
  WITH PRINTER PORT
- EGA CARD 120
- VGA CARD 295

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- 5060 STYLE KEYBOARD ..... $ 45
  84 KEYS, LARGE RETURN KEY, 3 LED INDICATORS
- 5161 STYLE KEYBOARD, TACTILE/CLICK 57
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- KEYTRONIC 101 KEYS 55

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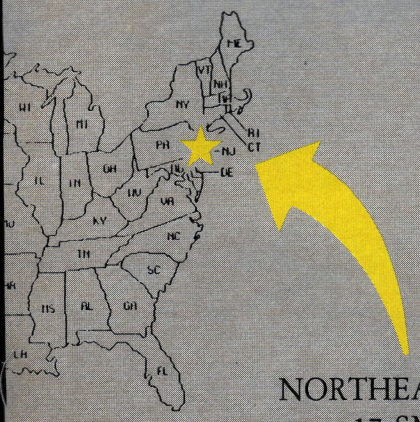

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286-12
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- 6/12 MHZ Turbo Main Board
- 200WT UL Power Supply
- 101-Key Tactile/Click Keyboard
- Operations Manual $495

286-10
- 286 Turbo Case
- 6/10 MHZ Turbo Main Board
- 200WT UL Power Supply
- 101-Key Tactile/Click Keyboard
- Operations Manual $435

286-10B
- Baby 286 Turbo Case
- 8/10 MHZ Turbo Main Board
- 180WT Baby Power Supply
- 101-Key Tactile/Click Keyboard
- Operations Manual $425

STI BARE SYSTEMS

Standard Features:

- 512K Memory 100NS, Expandable to 1MB
- Dual Speed 6/10 MHZ, 0 Wait State
- Landmark 12 MHZ
- 200WT UL Power Supply
- Eight Expansion Slots
- One 1.2MB Floppy Drive
- Dual Floppy and Hard Disk Controller
- 1 Parallel, 2 Serials, Real Time Clock, Game Port
- Enhanced 101-Key with Tactile/Click Keyboard
- 286 Turbo Case
- Operations Manual
- One Year Warranty

$$ See Price Table $$

STI 286-10

Standard Features:

- 512K Memory 80NS, Expandable to 1MB
- Dual Speed 6/12 MHZ, 0 Wait State
- Landmark 16 MHZ
- 200WT UL Power Supply
- Eight Expansion Slots
- One 1.2MB Floppy Drive
- Dual Floppy and Hard Disk Controller
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- Enhanced 101-Key with Tactile/Click Keyboard
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STI 286-12

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• ST-238/KIT 30MB	295
• ST-4096 80MB 28MS	650
• ST-251 40MB 40MS	370
• ST-251 40MB 28MS	455

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• TEAC 720K	98
• TEAC 1.2M	98
• TEAC 1.44M	120
• MITSUMI 360K	75
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8088 BASE

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• MULTI I/O (FDC + I/O PLUS II)	49
• SUPER MULTI I/O SUPER FDC + I/O PLUS II	69
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• RS-232 2 PORT	25
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• CLOCK	19
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• PARALLEL PRINTER CARD	12
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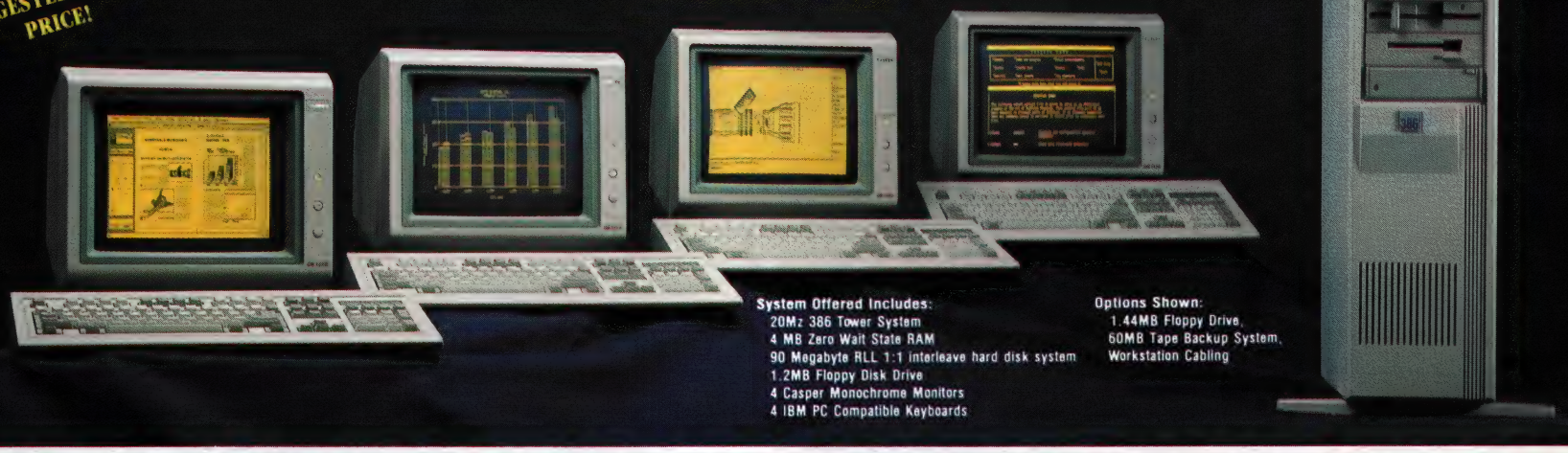

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The system provides a centrally based secure data base accessible by all users. The operating environment is compatible with off-the-shelf DOS application programs such as Lotus 1-2-3™, Symphony™, Auto-CAD™, Wordstar™ and Ventura Publisher™, all with system-wide uniformity and compatibility within the 386 Tower. We have provided for the integration with existing Netbios and Novell installations and fully support those environments. Multi-User graphics is provided at the workstations in 64K Hercules Graphics Mode. Screen writers are displayed at each station at the same rate generated by the processor. The problem with ill behaved programs writing directly to video ram is eliminated. Each station user has a serial port which can be used with a mouse or other pointing device. This system is a complete replacement to Networks and LAN's, and establishes the lowest cost per user, high performance multi-user solution available. ***This system is the solution!***

VIDEO NETWORK ADAPTER

The Video Network Adapter (VNA) is a full size IBM AT compatible card designed to emulate four Hercules compatible display adapters, and the logic to interface four IBM PC compatible keyboards in one slot. The VNA provides the most compatible graphics display workstation solution for the Multi-User PC market. VNA eliminates the need for individual PC's at each user station as with Novell and other Network based Multi-User systems. Compared to the earlier Multi-User PC systems which used expensive dumb terminals and slow ASCII communications VNA allows worksations to transmit display data ***several hundred times faster***.

VNA is so transparent that the application program operates as if it were in a 640K single user PC/AT environment. The result is full PC DOS application software compatibility on each workstation. Multiple VNA's can be used to support a maximum of sixteen workstations. All these features add up to fastest most efficient and low-cost Multi-User solution available.

INSTALLATION AND SETUP

As with all systems delivered by Sunnyvale Memories rigorous testing on the hardware takes place even prior to system integration. We install the PC/MOS-386 Operating System and pre-configure your hard disk and workstations. This eliminates all the guesswork associated with the installation of Networks and LAN's, it arrives at your location ready to ***plug in and go to work!***

Physical installation is so simple it only requires the use of a screwdriver. Each workstation can be 400 feet away from the host system using standard 25 pin conductor cable. Connect the workstation adapter to the Tower, then plug the keyboards and monitors into the workstation adapters. We have found that setup of four workstations 25 feet from the host **REQUIRES ONLY 30 MINUTES FOR COMPLETE INSTALLATION!**

SUPPORT AND SERVICE

Sunnyvale Memories has a fully trained support staff available to help with your installation needs and will quickly respond to your most demanding requirements. Our reputation for excellence in customer support is well known and continues to enhance the value of the products we sell. We take the same pride in our support program that we have taken in designing this unique product. When you make a purchase from Sunnyvale Memories you can be assured of the finest most comprehensive support available in the industry. In addition to Sunnyvale Memories support The Software Link will also be available to provide you with support related to all of your software needs.

In a Multi-User environment, service of the hardware is of highest importance. As with all Sunnyvale Memories products, a 12 Month Inst-X-Change Warranty is offered at no charge. Special service and installation contracts are available for the more demanding situations and on-site service is also offered.

PURCHASE INFORMATION

Sunnyvale Memories is developing a nationwide distribution network for the 386 Micro-Mini Multi-User System. We are encouraging Dealers and Network Consultants to contact us for information on our distributor programs and dealer pricing. Corporate, Institutional and End-Users are invited to call an authorized distributor in your area or call Sunnyvale Memories Tower Group for direct purchasing information.

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High-Speed Multi-User Color Graphics

New 386 Solutions Challenge Workstations

by Peter Ruber

Operating systems compatible with DOS and UNIX, multiport graphics cards, and fiber-optic linked terminals—from Digital Research, SunRiver, Concurrent Controls, Viewport Technology, Virtual Systems, Santa Cruz Operation, The Software Link, Intelligent Graphics Corp., Advance Micro Research, Interactive Systems—join forces to invade the turf of the dedicated workstations for CAD/CAM and Desktop Publishing applications.

Multiple graphics running under Concurrent DOS 386 MGE on the SunRiver terminals.

Return Of The Terminal

For more than a half dozen years, IBM and Microsoft have been de-fucho leaders setting the ground rules for hardware and software development in the desktop computer industry. During the past year, however, there is strong evidence that suggests their influence has begun to wane.

On the hardware side, the IBM Micro Channel's proprietary architecture has failed to capture the public's imagination, or lived up to IBM's sales projections. As a result, a new generation of computers, based on the original AT bus standard, remain in control of the market, so that IBM has released the PS/2 Model 35 computer with the AT bus inside a PS/2 case.

On the software side, in spite of the tremendous publicity that both companies have generated in the trade press, the much-touted "next generation" operating system (OS/2) has so far managed to generate only a token acceptance by both hardware vendors and third party software developers. Being a single-user, multi-tasking operating system, OS/2 is (in the words of one critic) a solution in search of a problem. The real problem, for which a solution has long been sought after, is how do you satisfy the insatiable business and industry demand for low-cost multi-user graphics systems that aren't based on the complexities of a networked environment?

Fueling this demand is the availability of powerful desktop publishing and business presentation graphics applications running under graphics-based operating environments like GEM and Windows under MSDOS, and X Windows under UNIX.

In spite of the successful inroads multi-user operating systems have made into corporate America during the last two years, they all suffer from a common ailment—the inability to support multiple graphics sessions.

Multi-user systems are built around multiport I/O cards that can support from two to eight serial terminals. Since serial transmission to these terminals is made one data bit at a time, even high baud rates of 19,200 baud are only capable of displaying character-based applications. This limits workstation clusters to running standard word processing, database, accounting, and related business software.

In a quest to support multi-user graphics, the major developers of multi-user operating systems have been working with several start-up engineering firms to provide affordable graphics terminal solutions that will move large chunks of bit-mapped data at the blink of an eye. These solutions include fiber-optic transmission and hardware that allows direct access to video RAM.

The Tip Of The Iceberg

I had originally planned to discuss multi-user graphics in my Concurrent DOS 386 column. But as I talked with OEMs and the marketing people at SunRiver Corp., I learned that the DRI/SunRiver connection was merely the tip of the iceberg. A large-scale movement was in progress that encompassed the entire DOS and UNIX multi-user market. I've been following this movement for the better part of six months, from early Beta versions to the final engineered product releases of both the operating systems software and the hardware engines.

Four basic hardware product concepts are now available for multi-user graphics. Two are from SunRiver Corp., and are designed around a fiber-optic communications link. One is a group of Hercules Graphics compatible monochrome, and EGA or Multiscan EGA color graphics terminals; the other is a PC Fiber Optic Station Emulator graphics interface that allows you to use desktop AT's instead of the terminals.

The third hardware platform is from Advance Micro Research, called the Video Network Adapter (or VNA). It consists of a multiport host adapter graphics interface. This is a translation unit that distributes signals to interface units which host monochrome monitors and keyboards. A VGA color graphics version was in Beta testing at this writing and is expected to be released soon.

The final system is from Viewport Technology. This is an EGA color graphics system, somewhat on the order of AMR's VNA system, except that remote station controllers connect directly to the host controller.

Most of these hardware platforms support local serial I/O for pointing devices (mice or drawing tablets), printers or modems. Some also provide a local Centronics compatible printer port. As a hardware family, they have moved the terminal out of the background and into the professional arena capable of manipulating hi-resolution bit-mapped graphics in a very cost effective manner.

They are, admittedly, first generation products, but it gives them pioneer status in a brand new market segment that taps the power of the 80386 processor. I strongly suspect that within the next year other manufacturers will enter the multi-user graphics market. This competitive environment will certainly spark the creative design juices, and we will have an entirely new generation of computer hardware to play with.

Multi-user Graphics Operating Systems

None of the hardware solutions covered in this report will directly provide multi-user capability. This functionality can only be performed by the operating systems. Some will support multi-tasking at the host and workstation as well. Others support only a single graphics application at each workstation. The degree of sophistication that the end-user requires will dictate the choice of operating system and multi-user graphics hardware.

Multi-user operating systems supporting graphics fall into three major groupings: PC/MSDOS compatible operating systems, control programs that run under PC/MSDOS, and the UNIX/Xenix operating systems. This will allow the installed user base of these operating systems to upgrade from character-based to graphics-based productivity.

Multi-user operating systems (particularly those compatible with DOS) also reduce the complexities and cost of networks based on using PCs or diskless workstations. Instead of requiring a separate network card for each station, clusters of two to sixteen users can be formed from a single 386 host computer, and then bridged to other clusters through network cards. Groups of graphics-based workstations can be integrated into most existing industry

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COMDEX/Fall '88
Sneak Preview

FASTCOMM Communications FDX 9624 Full-Duplex 9600 bps Modem

ARK 2400 bps Dial Modem

by Douglas E. Kilarski

With over 1,600 exhibiting companies, the equivalent of 9000 10'x10' booths and 95,000 expected attendees, we thought that a show preview would be in order.

Come this November 14-18th, Las Vegas, Nevada will be the focal point of the computer industry. This is the tenth anniversary of COMDEX/Fall and is being billed as the largest computer industry event in the world. Along with the 1600 exhibitors is an impressive 55 session conference program. Each session has been specially designed to benefit the independent reseller.

The conference schedule begins with a keynote address by industry notables Rod Canion, president and CEO of Compaq Computer Corporation; William H. Gates, co-founder and chairman of the board, Microsoft Corporation; Rick Inatome, president and CEO Inacomp Computer Centers, Inc.; Phillippe Kahn, president, Borland International, Inc.; Robert M. Kavner, president, Data Systems Group; AT&T; Terry R. Lautenbach, IBM senior V.P. and general manager of IBM United States. Each will speak on varied topics that address the future and history of the personal computer industry.

With an emphasis on business generation for independent resellers, strategies on increasing profit margins and efficiency are stressed. The latest information on new products and technologies is also presented for planning and direction well into the 1990s.

Other topics include hardware and software alternatives, market forecasts, applications software, connectivity issues, reseller marketing, and international marketing. Each topic is broken down into four to seven sessions, each discussing a different aspect of the main theme.

Additionally there are four half-day workshops for resellers interested in new marketing concepts. Major emphasis is placed upon retail sales, telemarketing, advertising and direct mail campaigns. Each is geared for short term results and is presented by computer industry, marketing experts.

COMDEX/Fall is so large that you have to prioritize your interests and make use of the multi-media show coverage. Not only is there a daily newspaper but also television coverage that is at times live. The cable coverage is accessible directly from your hotel room and from monitors throughout the show. A + 400 page program and exhibits guide is also mandatory. The guide includes maps, a product locator and exhibitor listings.

Nearly 100 past exhibitors were contacted for information on products that will be introduced at this COMDEX. The responses provide an exciting sneak preview of this years' show. You will also find some products that have already been announced but will first be shown this fall.

Of course, there will be additional announcements after this writing. These will be covered in the January issue which will forecast what to expect for the coming year. Remember that at this early press date much is still unknown. We included as much as was made available, including some of the booth themes.

This COMDEX/FALL'88 preview has over 60 new product announcements. Two manufacturers, Tandy and Northgate, are introducing complete new lines and have been given sections to themselves. The balance of the preview has each new product classified into one of seven categories. They are Systems, Monitors, Printers & Plotters, Software, Communications, Storage Controllers & I/O Expansion Boards or Ancillary Products. We hope you enjoy this sneak preview.

Tandy

Tandy will unveil to the public their new line of PC-compatibles; 5000 MC, 4000, 4000 LX, 3000 NL, 1000 TL and the 1000 SL.

The 5000 MC is the most powerful 80386 based machine Tandy has introduced. It is American made, features a 20MHz Intel 80386 microprocessor, includes an Intel 82385 memory cache controller, 32K of high speed RAM and has built-in VGA graphics. The 5000 is also equipped with IBM Micro Channel compatible architecture. [5000 MC List Price $4999]

The 4000 LX is a 20MHz 80386 system and the 4000 a 16MHz. Each has as standard one 3.5" 1.44MB floppy disk drive and provides complete compatibility with future MS OS/2 software. The LX comes with 2MB RAM

continued on page 13

Stan Veit's History
10 Years Since The First Comdex!

There were many Computer Shows before 1979, for example, there were the huge National Computer Conferences where the entire industry showed the advances made since last year. At the NCC, the main interest was mainframe and large minicomputers, while microcomputers were relegated to the basement, or attic, out of the way of "real computers." There were also the Computer Faires and other personal computer shows where the hackers and other personal computer fans could see the latest hardware and software, buy new equipment on the inside and trade junk on the outside.

The Interface Group held a different kind of show, in several locations. Each of these shows was called "Interface" and featured vendors who put together complete systems and sold turnkey systems. They said they showed and sold solutions to business problems. To my mind these shows were much more interesting than NCC which tended to be huge displays of iron.

Sheldon Adleson, the head of Interface Group saw that there was a completely new group forming in the computer industry. He called them ISOs (Independent Sales Organizations) and they used microcomputers or minicomputers to solve business problems for small and medium businesses that previously could not afford computers. The ISOs were dealers, software houses, OEMs who put systems together, sales reps and office products/machine dealers. There was at that time no show for them to display their wares and no conference for them to get together and learn from one another.

From that need, Sheldon Adleson created the first Comdex in 1979. This first show was held at the MGM Grand Hotel in Las Vegas, Nevada from December 3 to December 5, 1979. Las Vegas was a wonderful place for a conference. As one of America's playgrounds, it was not hard to get people to come. Yet it was remote enough so that merely curious people would not attend. There was space for almost any size meeting and plenty to do after show hours.

Almost 4,000 people attended the first Comdex, visiting 157 exhibitors who displayed their products in 267 booth units in the exhibit areas and Grand Ballroom of the MGM Grand Hotel. In addition to the exhibits, Comdex had thirty-three business oriented conference sessions with something of value for everyone. The keynote theme of the show was "ISOs for the Computer Industry's Decade of Challenge

continued on page 117

COMDEX '88 Preview continued from page 12

and the 4000 1MB. The 4000 series is being positioned as a hub within a multi-user environment. [4000 LX List Price $3999, 4000 List Price $2599]

The 3000 NL is billed as the affordable 80286. The NL is a 10MHz 80286 machine with seven expansion slots, four front panel peripheral slots, one 3.5" 1.44MB floppy disk drive and a high performance memory expansion slot. This system is also MS OS/2 software compatible. [List Price $1699]

The 1000 TL is an 8MHz 80286 based machine with 640K RAM, one 3.5" 720K floppy disk drive and ROM based MSDOS and Deskmate. The TL also has enhanced sound and speech capabilities. The TL is a home office or business system. [List Price $1299]

The 1000 SL has an 8086 microprocessor, 384K RAM, one 5.25" floppy disk drive, enhanced sound and speech capabilities with ROM based MSDOS and Deskmate. [List Price $899] See the complete Tandy line at Booth #1321.

Northgate Computer Systems

Northgate will display five new systems and will show new software, keyboards, a faxcard, VGA video and announce MSDOS 4.0 as their standard operating system.

5 New Systems—Low end 12MHz 80286, 16MHz 80286, entry level 80386 based upon the Intel XT chip, 20MHz 80386 and a 25MHz 80386 featuring 128MB of high speed cache capabilities.

SCSI High Performance Storage—Each Northgate system now has the option of 40MB to over a gigabyte of SCSI technology hard disk storage.

MSDOS 4.0 Standard—Northgate is one of the first to offer MSDOS 4.0 standard with all their systems.

VGA Video—Northgate video options now range from monochrome graphics through VGA incorporating the 16-bit, high performance Video Seven chip set.

Northgate/NET Multi-User System—Northgate will introduce a "workstation-less" multi-user system. This low priced true multi-user system consists of a board installed in a Northgate 80286 20MHz file server; cabling to workstation locations, with only a keyboard, interpreter junction and monitor at each station. The system uses MS-NET and provides users full desktop PC functions, operating under MSDOS.

Northgate Omnikey+ & Omnimac+ Keyboards—The famous "click/tactile" feel remains unchanged from the standard Omnikey keyboard. What has changed is key layout and compatibility.

The new Omnikey+ has a third asterisk (*) key added to the right of the spacebar, along side of a moved backslash key. Omnikey+ has switching that enable the keyboard to be compatible with up to 15 other systems, including Apple and Macintosh.

Omnimac+ is a dedicated Apple/Macintosh model complete with Apple colors and special to Mac keys. The Omnimac+ has similar switching and compatibility with IBM type machines.

Northgate Faxcard—Northgate will introduce their new Faxcard for PC, complete with menu driven software.

For additional information on the complete line of new Northgate computer systems stop by Booth # H7552.

Systems...Towers To Handhelds

Alloy MultiWare/386 System

This hardware supported multi-user, multi-tasking system is based upon an 80386 personal computer. The components of MultiWare/386 are the NX/386 multi-user, multi-tasking operating system, the IMP/2 intelligent dual serial port card, the IMP/8 intelligent 16 serial port card and the TAP (Terminal Array Panel) outboard for the IMP/8, providing 8 serial ports for terminals and 8 serial ports used as communications ports.

DAP Technologies Micro-Flex PC 1000 Hand-Held.

The NX/386 is the nucleus of the MultiWare/386 system. It is fully compliant with DOS. The system allows for the management of multiple virtual 8088/8086 DOS partitions for each user/task and provides multi-user file access capability, including NetBIOS facilities. Print spooling, print queue management, session management and time slicing the 386 CPU with high and low priority queues are also supported.

MultiWare/386 provides an easy and economical means of creating multi-user, DOS-based workgroups, using 80386 based personal computers. Systems ranging from 2 to 21 users can be installed. See the Alloy MultiWare/386 at booth #1168.

DAP Technologies Microflex PC 1000

Desktop power that fits into the palm of your hand. Its operating system is MSDOS using an 80C88 microprocessor. This compatibility allows you to upload or download programs through the standard RS-232 port via cable or a Hayes compatible modem to any MS-DOS PC at speeds up to 38,400 baud.

The Microflex PC 1000 comes in five standard memory configurations: 256K, 640K, 896K, 1.2MB and 1.5MB. The keyboard features 47 standard keys with multi-function numerical and alphabetical separate keys with audible feedback. The PC 1000 has a highly readable, 16 line LCD display with graphic capabilities. Accessories and peripherals may be connected via standard DB-15 connectors. See the Microflex PC 1000 at Booth #H7070.

Mitac International Paragon 286VE

Mitac will be showing off its new 16MHz 80286 Paragon 286VE. The basic model has a socket for an 80287-8 math coprocessor, 1MB RAM, floppy controller, VGA-compatible graphics, 5.25" floppy disk drive, free 3.5" floppy disk drive, two serial I/O ports, one parallel I/O port, six expansion slots, MSDOS and GW BASIC. The basic system is priced at approximately $2750. See the new Mitac Paragon 286VE at Booth #3008.

Western Dynex removable Winchester drives.

NEC Information Systems Powermate SX And Powermate SX Portable

NEC will introduce two personal computer systems based upon the new Intel 386SX microprocessor—Powermate SX and Powermate Portable SX.

The Powermate SX is a small foot-

continued on page 30

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Thickness.....003 inches
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Coating thickness.....100 micro inches each side (burnished)
Hygroscopic expansion.....coefficient less than 15 x 10^{-6}in./in./RH%
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Coercivity.....320 oersteds nominal
Resistivity.....less than 5 x 10^{8}ohms per square
Clipping level.....75% - guaranteed 50%
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Track density.....48 TPI
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GENERAL LEDGER
Allows for multi company ledgers.
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User can process transactions 2 periods into next year.
Allows budgeting.

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20MB Mono System

Basic system with 20MB Hard disk, Mono card, Monitor, Parallel and Serial Port

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Specials

Sigma Laserview Desktop Publishing 19" Monitor	$1,350
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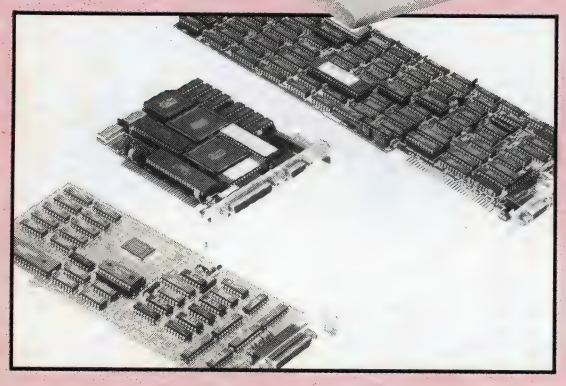
Epson FX 86E	$299
AT HD/FL 1:1 Interleave Controller	$179



Graphics Boards

QIC Micro EGA Deluxe **$154**
Display 640 x 480, 16 colors EGA mode, 720 x 348 Hercules mode, 640 x 200, 16 colors, RGB mode. 132 columns.

QIC Monographics **$65**
720 x 348, Hercules compatible, printer port.

QIC Color Card **$65**
IBM Color card compatible, 320 x 200, 4 color, RGB and composite output, parallel printer port.

Orchid designer VGA **$340**
640 x 480, 256 colors, 132 column, zoom feature.

VGA Card **$299**
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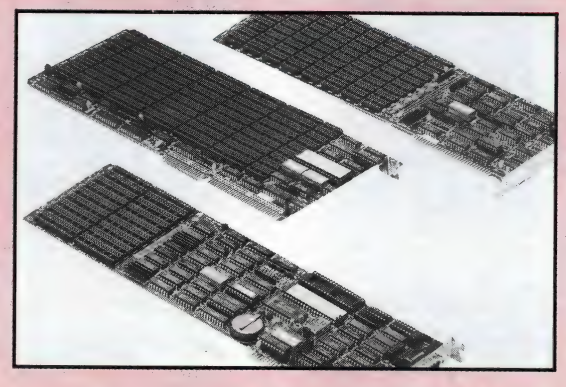

EMS Boards

EMS Board for AT(10MB) **$150**
expandable to 8MB, Lotus/Intel/Microsoft compatible, and 10MB Extended memory.

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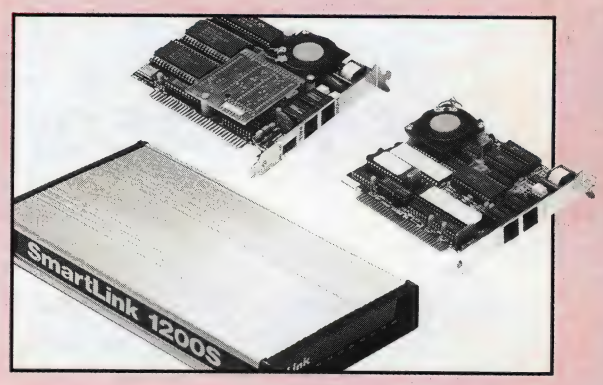
Running 12Mhz, Half height card powers your 8088 to run like an 80286.



Modems

Everex Evercom 300/1200 ..... **$75**
1/2 size, Hayes/Bell 103, 212 compatible, support COM1-COM4. With BitCom software, made in the USA.

Everex Evercom 1200/2400 ..... **$155**
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Datatronics 300/1200 Pocket Modem **$99**
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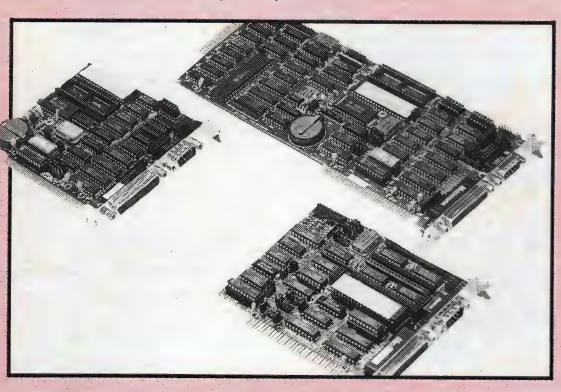


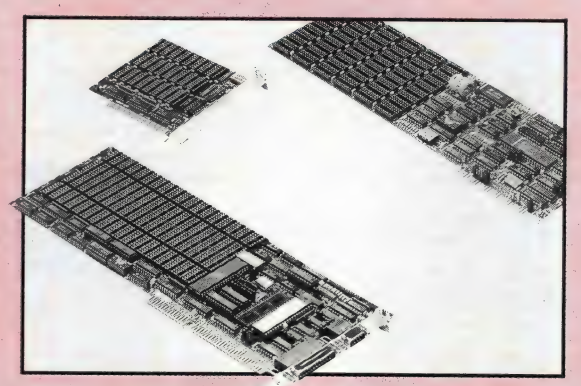
I/O Cards

I/O card for XT **$69**
Parallel, serial (2nd serial optional), and clock/calendar.

I/O Card for AT **$69**
Parallel, serial (2nd serial optional), and game.

Serial Card **$25**

Serial Upgrade **$15**



Memory Boards

Multifunction for PC/XT **$85**
Parallel port, serial port, game port, expandable to 384K, clock/calendar.

Short Memory card **$49**
0-576, using 64K or 256K, 1/2 size.

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Okidata 320 Par.	$359
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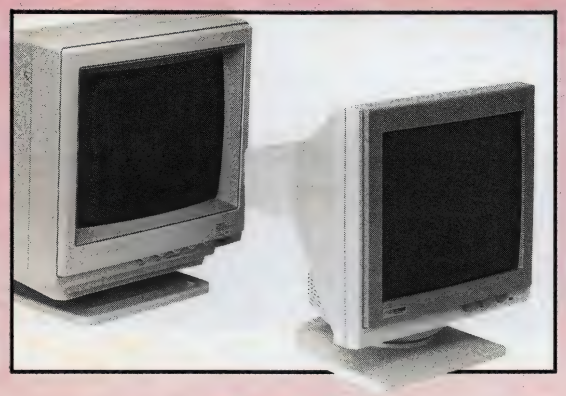

Monitors

Amber Monitor **$85**
12" non-glare, 100 x 350 resolution,tilt and swivel base.

Color Monitor **$275**
14" RGB, 640 x 200, 16 colors.

EGA Monitor **$360**
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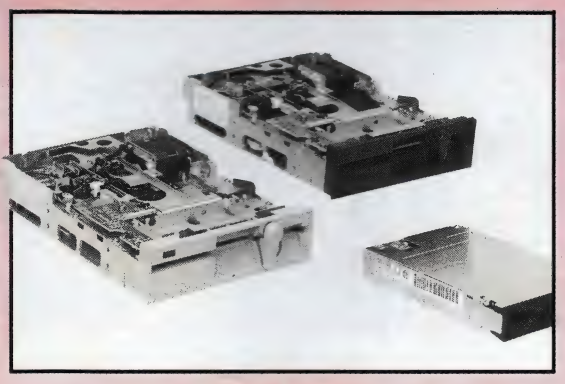
NEC Multisync II Monitor **$595**
14" EGA, CGA, PGA VGA, compatible 800 x 560, tilt swivel base.



Floppy Drives and Controllers

TEAC 360K Floppy drives for XT **$85**

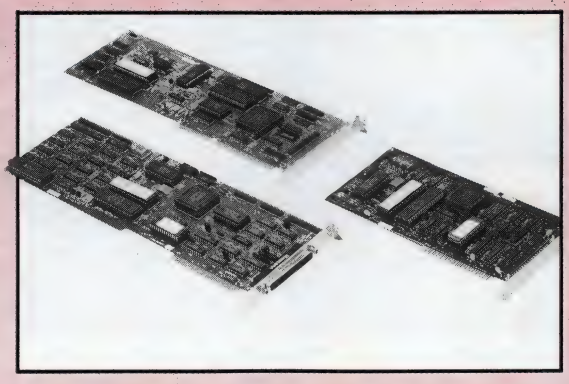
TEAC 1.2MB Floppy drives for AT **$97**

720K 3 1/2 MB in drive for XT or AT **$105**

Floppy Disk Controller for XT **$30**

Sony 1.44MB, 3½" Floppy drive **$125**

Mitsumi 360K, 5¼" Floppy drive **$75**



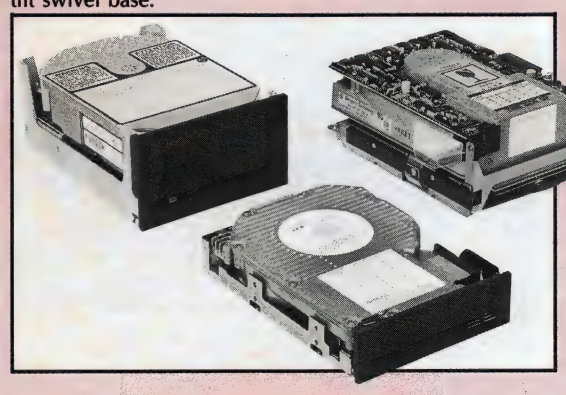
HD/Floppy controllers

Hard disk controller **$80**
Western Digital chipset, control 2 hard disks, (XT version), compatible with ST225, ST4026, ST4038, and ST251 (special ROM).

Hard disk/floppy card for AT **$129**
16-bit, XT size format, Western Digital chipset, controls 2 hard disks and 2 floppy drives.

Hard disk/floppy card for XT **$119**
Western Digital chipset, control 2 hard disks and 2 floppy drives.

Super Floppy Controller Card **$59**
Drives a pair of 360K, 720K, 1.2MB or 1.4MB floppy drives.



Hard Drives for AT

Seagate ST225 Drive only
20MB (65ms) **$219**

Seagate ST138 30MB (40ms) **$315**

Seagate ST4096 Drive only
80MB (28ms) **$690**

Seagate ST251 Drive only
40MB (40ms) **$349**

Micropolis 42MB (28ms) **$595**

Mircopolis 72MB (28ms) **$675**

PRIAM 130MB (25ms) **$1,695**

Maxtor 300MB (28ms) **$2,560**

PC/XT Hard Disk Drives

Quality HD Kit comes with controller cable, manual, software, and mounting screws, 24 hour burn in.

Seagate ST225 20MB (65ms) **$279**

Seagate ST238 30MB (65ms) **$299**

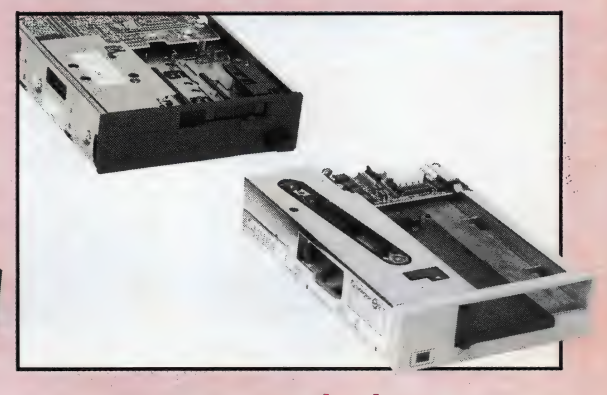
Seagate ST251 40MB (40ms) **$425**

Products for PS/2

2MB Memory board **$269**

4MB Memory board **$299**

60MB Tape Back-up **$1,199**

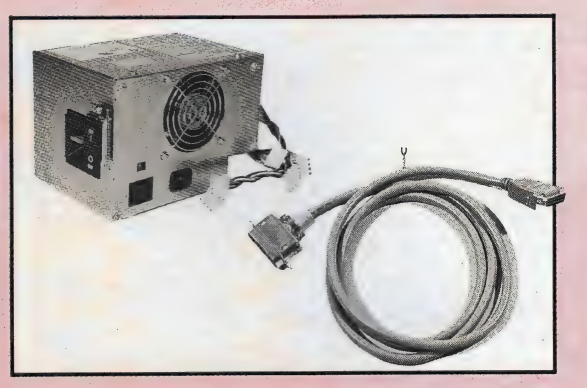


Everex Tape backups

Backup 20MB in less than 5 minutes, features image/file-by-file backup and restore, window driven software, made in the USA.

	Internal	External
TEAC 60MB Cassette	**$650**	**$690**
Wangtek 60MB Cartridge	**$757**	**$827**
Wangtek 120MB Cartridge	**$995**	**$1095**

Video Tape back-up **$279**
Use your VCR to back-up your Hard Drive.



Accessories

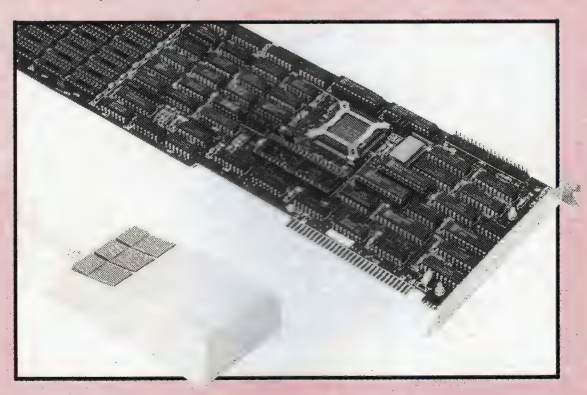
Vertical Computer Stand **$15**

Keyboard **$55**

Monitor extension Cable **$9**

Power surge protector **$17**

Power Pad **$26**

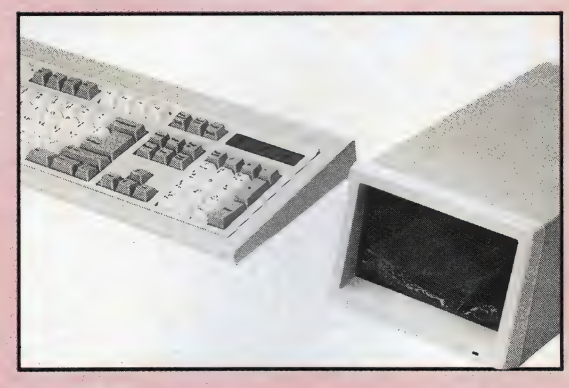


Accessories

Microsoft Compatible Mouse **$45**

Accelerator **$259**
Turns your PC/XT into AT, compatible with IBM PC, XT, 7 times faster than PC/XT, 33% faster than 6MHz IBM AT, 16-bit 80286 design.

Full Size Expansion Chassis **$429**
7 slots, no wait state design, 150 watts power supply, room for 4 1/2 height drives, round shielded cable.



Accessories

Keytronic® Enhanced Keyboard **$55**
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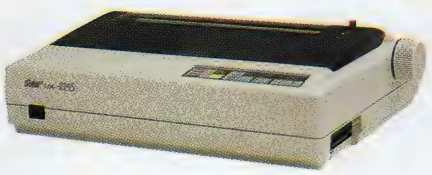

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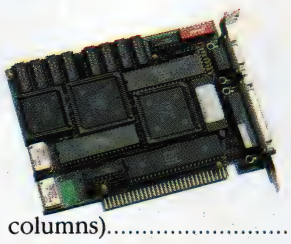

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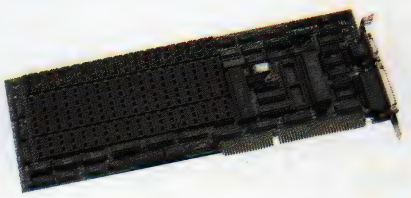

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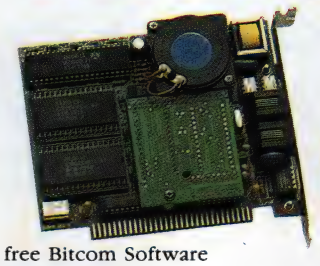

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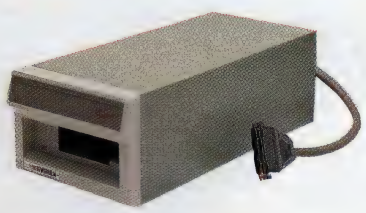

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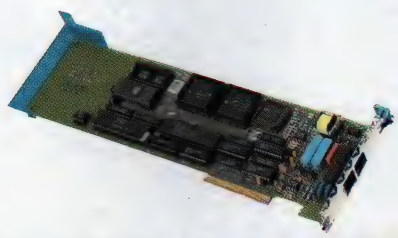

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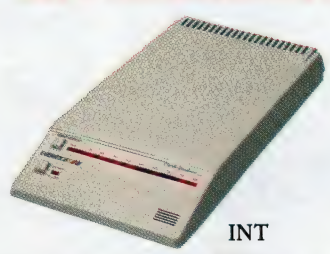

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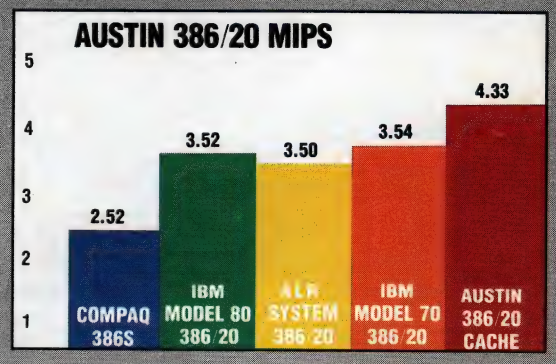

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Supports 1:1 interleaving	YES	NO	NO	NO	YES	NO
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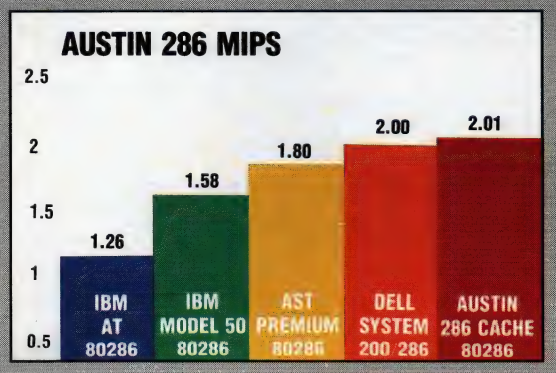

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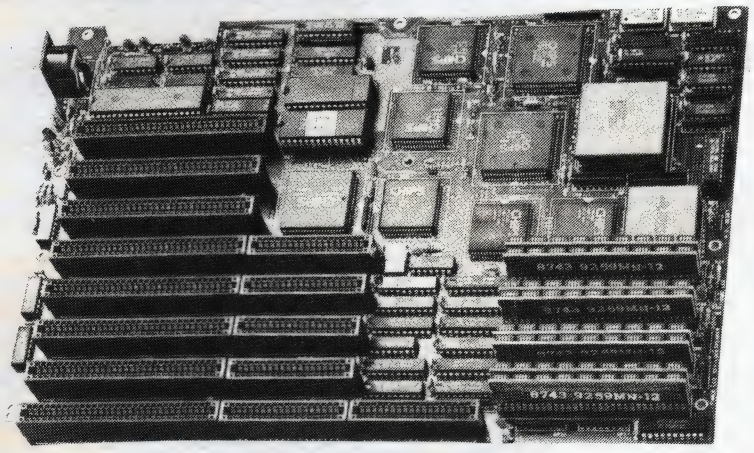

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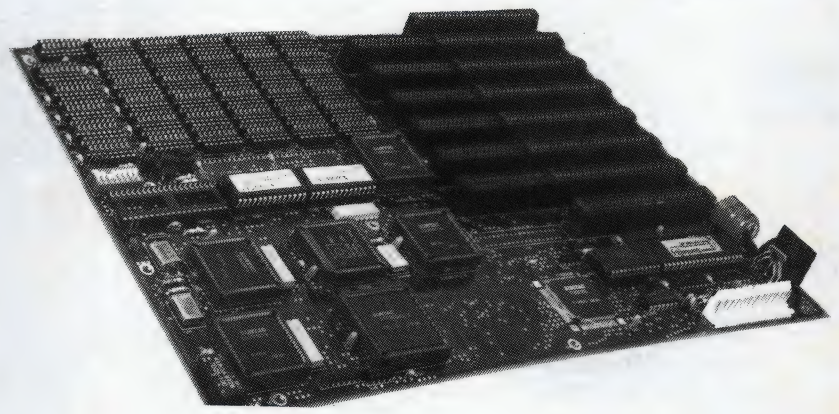

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The Mach 20 Performance System

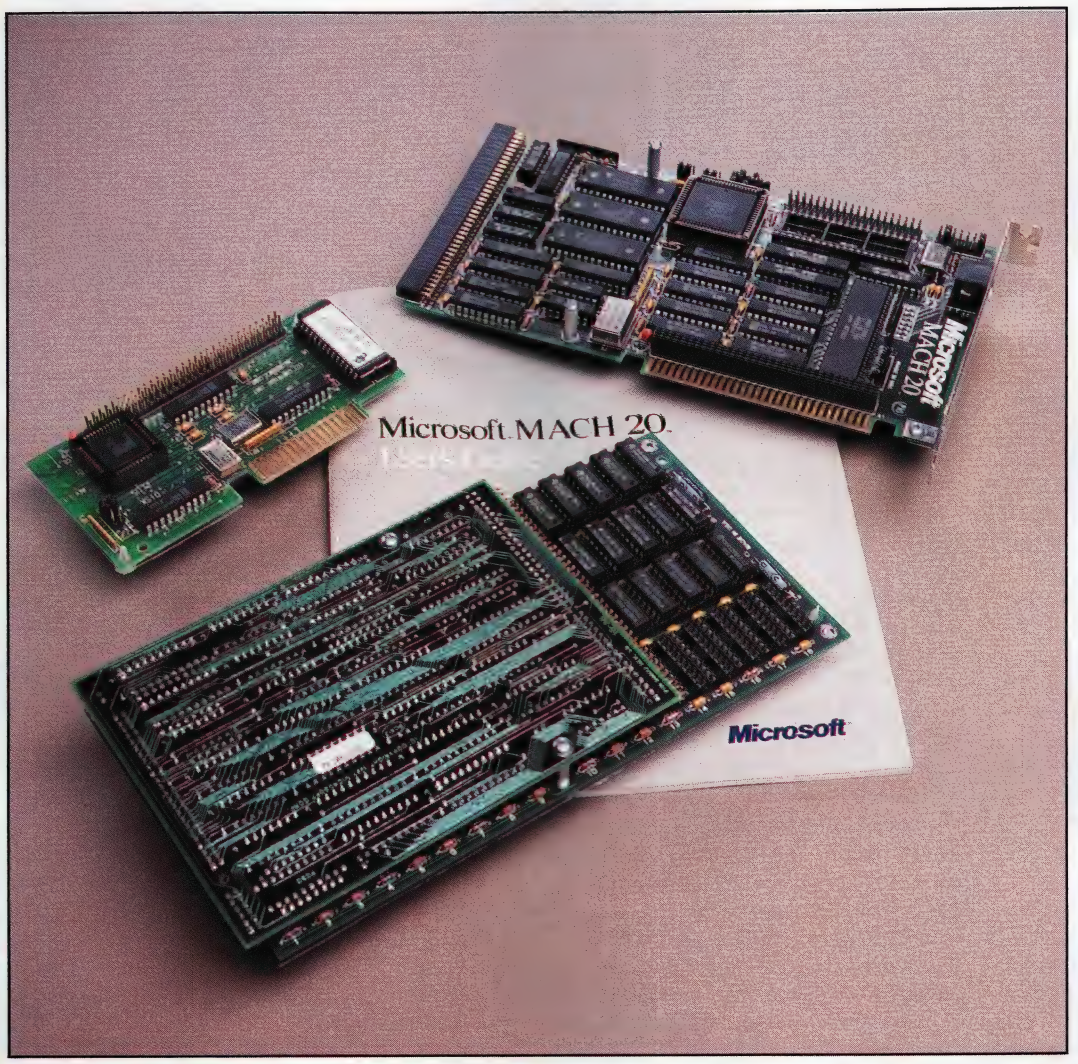
Microsoft Delivers 286 Power And More

by Ted Drude

If you own an older PC or XT compatible computer, you've probably considered upgrading to a newer 286 or 386 based machine. But getting rid of an older system in which you've sunk a lot of money can be difficult. It's rare that you'll be able to recoup more than a fraction of your original investment. Then you have to face the "sticker shock" of buying a brand new machine.

One alternative is to upgrade your present system with a 286 or 386 coprocessor board. It's more affordable and can provide a decent improvement in CPU speed. Your investment in hardware can be extended for a reasonable cost.

However, running a coprocessor board in your computer usually isn't the same as having an AT-bus machine. CPU speed is only one measure of a system's total throughput. Disk drive and expanded RAM access speeds are still quite a bit slower in PC/XT-bus systems, since the expansion slots are only eight bits wide, versus sixteen bits on the AT. Usually PC coprocessor boards can't run software written specifically for the new CPUs either (e.g. Windows/386, Windows/286, OS/2, etc.).



Microsoft's Mach 20 system is a modular upgrade package.

If you're looking for a coprocessor board with more of a future, you might want to check out Microsoft's Mach 20. It's a 286 CPU upgrade and more, designed for IBM PCs, XTs, and 100% compatibles. The Mach 20 Performance Enhancement System is designed to improve total performance, with its expanded memory and multi-media disk controller options. The Mach 20's software compatibility is pretty good, too. It will run DOS, Windows 2.0, Windows 286 and a special version of OS/2. Microsoft's direct support of the Mach 20, while not perfect, helps set it apart from other available 286 upgrades.

Mach 20 System Overview

The Mach 20 Performance Enhancement System actually consists of three circuit boards, encompassing four functions. First is the basic Mach 20 CPU upgrade board containing an 80286 CPU, running at 8 Mhz, and a Microsoft InPort mouse connector (the mouse itself is optional). The second board is the Mach 20 Memory Plus, a memory upgrade option, providing 512K to 3.5Meg expanded RAM. The Mach 20 Disk Plus board is a multi-media floppy disk controller, capable of handling both 5.25" and 3.5" floppy drives in all densities.

The Mach 20 system has a unique modular design. The Memory Plus upgrade connects with the Mach 20 base unit, turning it into a full length expansion board. The Disk Plus also piggybacks onto the Mach 20 board. In fact, with Disk Plus installed, the Mach 20 board can be used to replace an existing floppy disk controller, and take up no new slots in the computer. This is especially important for upgrading older PCs, where the total number of expansion bus slots is limited to five.

Because of its modular design, the Mach 20 can be upgraded gradually. You can start out with just the 286 CPU upgrade board, then add either the Memory Plus or Disk Plus options. You can buy just the capabilities you need now, and upgrade later, making the Mach 20 more affordable. The base Mach 20 board retails for $495, Memory Plus is $395, and Disk Plus sells for $99.

Installing The Mach 20

The installation process is greatly simplified through the use of a utility program included on disk. The Mach 20 installation program checks out your current hardware, then provides a graphic display showing how the board options jumpers should be set for your machine. When the Disk Plus or Memory Plus boards are added, the program shows how those jumpers should be configured, too. If you add an option later, you just rerun the program and it guides you through the process.

We had no problems with any part of the installation of the Mach 20. We've tested numerous 286 coprocessor boards over the years and think the Mach 20 is one of the easiest to get up and running, thanks to this program. Well written user manuals are provided with each board too, and Microsoft maintains a hardware support phone line for those who have unusual problems.

The Mach 20 board itself uses a single, half-length PC bus slot for the CPU upgrade, or a full-length slot if the Memory Plus option is added. When the board is installed, the 8088 CPU is removed, and a 40.pin cable is run from the motherboard's CPU socket to the Mach 20. You'll also have to remove any 8087s you may have, since they won't work with the Mach 20. A special plug is installed into the coprocessor socket on the motherboard. (A socket for an optional 80287 math coprocessor is provided on the Mach 20 board.)

Onboard the Mach 20 is a 16K static RAM cache. That cache RAM is what gives the Mach 20 most of its speed. The Mach 20 pulls 8-bit memory into the cache where the 286 can run it at full speed, with no wait states, and using a 16-bit wide data bus. By keeping the most recently used code and data in the 16-bit cache, the Mach 20 is able to minimize the need to use the PC's slower 8-bit bus. The system recycles the contents of the cache memory as needed, replacing data that hasn't been used recently with new data, maximizing the use of the 16-bit bus.

The cache memory can be toggled on or off from the PC's keyboard, using resident hot key software provided on the installation disk. You make this program part of your AUTOEXEC.BAT file, and can define the keystroke sequences used to control the cache. This gives you the ability to control CPU speed. You enable cache memory for most operations, allowing the 286 to run at top speed. When you have software that is timing dependent, you can slow the system down to about as fast as a stock PC by disabling the cache memory.

Memory Plus Expanded Memory Board

The Memory Plus upgrade board consists of two separate pieces. One part of the board is the RAM controller circuitry, the other part is the RAM array proper. The two Memory Plus boards literally bolt together with the Mach 20 board, to create a solid full length card. The controller board has a special 78-pin connector on it which mates with the Mach 20 board, allowing full access to the 16-bit wide data path of the Memory Plus. The RAM array board has four rows of 18 sockets installed on it. When fully populated, it will hold 3.5 Meg RAM (1.5 Meg of 256K chips and 2 Meg of 1M chips).

The Memory Plus board comes with 512K RAM installed. Installing extra RAM on the array board isn't difficult, but the normal precautions apply (watch out for static electricity, bent pin legs, etc.). Connecting the Mach 20 and Memory Plus is also easy, once you get the edge connectors lined up properly. Again, the included installation program makes figuring out the proper switch and jumper settings a snap. The software even shows where to install new chips on the RAM array board when adding new chips.

When a Memory Plus board is added, Microsoft recommends removing all other RAM memory expansion boards. There are a couple of reasons for this. First, the Memory Plus board isn't compatible with other expanded memory boards. Second, you can "backfill" your conventional DOS RAM with the Memory Plus, and use more of the

continued on page 462

PC Brand's 386
Faster Than A Speeding Bullet

by Peter Ruber

When I needed an additional 386 computer to test the multi-user graphics hardware and software products featured in this issue, *Computer Shopper* suggested I contact PC Brand, Inc., because they had a new 25-MHz model available. I wasn't familiar with their product line, but a system that was faster than 16-MHz computers I had been working with would be a welcome addition.

A few small companies have been shipping 25-MHz 386s for about eight months, but these are beefed-up 20-Mhz systems. When components are pushed beyond their rated specifications, they generate excessive amounts of heat that could literally burn out the chips during protracted use. To prevent this problem, one firm I know that ships multi-user systems designed a small refrigeration unit that sits on top of the CPU and RAM to cool these components.

PC Brand's 386 actually defaults to 20-MHz at power up, which was confirmed by the Landmark CPU Speed Test. Why it didn't default to the advertised 25-MHz was confusing. The InfoWorld test program gave it a CPU performance rating of 3.1 out of a possible 5.0. That was a shade below the 3.2 rating for the IBM PS/2 Model 80, and the 3.5 rating for the Compaq DeskPro 386. Still, it was a respectable showing, which places it among the uppercrust of 386 computers in this class.

In turbo mode (activated by a front panel button or by a keyboard "hot key" sequence), the Landmark Speed Test showed that it ran consistently at 33-MHz during a 24-hour test run. By switching to the Speed2 version of the Landmark test, which inserted one wait state, the computer fluctuated between 30-/31-MHz. I ran the InfoWorld test again in the turbo mode, and it rated the CPU performance at 4.5. That paled the performance of the IBM and Compaq computers considerably. GEM and Windows graphics applications, which thrive in a high-powered environment, zipped around my screen faster than I could keep track of their movements.

But running a 386 in turbo mode generates massive doses of RF emissions, and the TVs in my house went haywire. Shielding RF emissions is a complex problem, because they emanate from board level components, drives, the power supply, and from all cables, connectors, and display devices. As computers become faster, containing RF emissions becomes even more challenging. I've noticed this year that more and more 20-MHz 386 systems are being released as Class A computing devices (meaning that they're suitable for business environments). Class B FCC certification is more prevalent on 16-MHz 386 machines.

To find out what feats of legerdemain the engineers at PC Brand employed to make their 20-MHz box run at 33-MHz, I called President Stephen Dukker for some answers.

PC Brand High Speed 386 Computer

"Some batches of the microchip are faster than others," Dukker said. "If a chip tests at less than 20-MHz, Intel will downgrade it to a 16-MHz device and sell it as such. By the same token, some chips perform better than 20-MHz, but they're still sold as 20-MHz parts. We test every 386 CPU we get in and screen out those with extremely low leakage, because they'll run at 25-MHz or better, and put them into our high-end systems. One out of every 40 or 50 CPUs will bench at 30-MHz or better. We also substitute certain gate arrays in the Chips & Technology chipset we use on our 386 motherboards with components that were designed 25-MHz operation in anticipation of the higher speed Intel parts. They were designed to reduce internal resistance which keeps the system running reasonably cool. Eventually, when Intel can deliver 25-MHz parts in quantity, we'll upgrade our standard systems. Ultimately, 35 and 40 -MHz computers will become commonplace."

These higher speed 386 CPUs find their way into file server and multi-user systems because the extra speed will compensate for the burden of supporting multiple users. "How long can your system run at the 33-MHz turbo mode before it exhibits erratic behavior?" I asked.

"Before we released ours commercially, we ran a test system in turbo mode day and night for almost two months under conditions that simulated the environment of our corporate customers. We use a 33-MHz system in-house as a UNIX Bulletin Board. We're one of the midwest hubs in the worldwide 'usernet' network."

System Checkout

The PC Brand 386 is packaged in a handsomely-styled cabinet. The frame on which the internal components and drives are mounted is similar to the Kaypro 386, but the external cosmetics are different. It can survive a direct hit from a Mack truck. The front panel has the requisite lock, drive icons and LED indicators, a Turbo switch and a Reset switch. The backplane has provisions for 8 slots, plus cutouts for additional 9- and 25-pin D-type connectors. This is a practical design consideration because additional I/O ports can be routed to these cutouts instead of stealing a backplane slot.

The motherboard is a 6-layer PCB designed by PC Brand and manufactured in Taiwan. It is a 3rd generation design in which there is almost total integration of gate array technology. The 7-piece Chips & Technology chipset has replaced nearly all the TTL logic found on other 386 boards. The original Intel 386 motherboard design, by comparison, looks like an aerial view of the parking lot at the Super Bowl. This reduced component count lowers in-circuit resistance.

My system was shipped with a 1.2 MB 5.25" floppy and a 1.44 MB 3.5" micro-drive. The hard disk drive was a Seagate ST4096, which formats to about 78-Megabytes. It's a high-performance drive that I've used in other computers. It's fast (28ms) and it's quiet.

The system has the AMI BIOS from American Megatronics, Inc. AMI is considered the No. 3 BIOS supplier after Phoenix Technologies and Award Software. Interestingly enough, I've had very few hardware/software compatibility problems with the Award and AMI BIOSes, while the Phoenix BIOS exhibits occasional conflicts.

Base memory is provided in the form of 2-Megabytes of 256Kx1 SIMM RAM modules with a 32-bit data path. The 256K modules can be replaced with 1-Megabyte modules for a total of 8-Megabytes on the motherboard. An additional 2- or 8-Megabytes of memory can be installed on a proprietary 32-bit expanded memory board. The interleaved memory arrangement allows relaxed DRAM precharge timing for continuous memory access, and the system will run at zero wait states even in turbo mode.

384K-bytes of memory on top of the 640K DOS limit can be assigned as Shadow RAM into which the BIOS of the ROM BIOS and the EGA BIOS can be copied. This can be accomplished through a program available from Chips & Technology. AMI also provides a similar program to set the CMOS registers.

If this computer is going to be used with a multi-user operating system, you don't want to consider using the Shadow RAM option because this chunk of memory can provide sufficient workspace for another user. There are some ROM BIOSes that may dump 1K or 2K of disk I/O routines into RAM when the computer is first powered up. This is done chiefly to speed up the system's performance, and it's also called Shadow RAM. However, it has no relation to the accepted usage of the former definition.

PC Brand pre-configures their 386s prior to shipping. However, if you wish to alter the basic system parameters, you can press the DEL key during the bootstrap in order to accessed the SETUP menu. These include the Date, Time, Diskette types, Hard Disk Drive type, Base Memory, and Expansion Memory. SETUP can also be access by typing SETUP 386.COM from the command line. There is also an S386.EXE program that can be used to establish wait states, Shadow RAM, DRAM types, setting the memory map, etc.

Disk Controller

The 16-bit floppy/hard disk controller is slightly longer than a standard half-size card. It is made by a Japanese firm called National Computer Ltd., and distributed in the U.S. by NCL America Computer Products, Inc.

The NCL 5425 will support up to two ST506/412 hard disk drives and up to two floppy drives. It uses only a handful of gate array chips to handle all drive functions, and it is manufactured using the latest surface mount technology. It can handle high-speed hard disk drives that are capable of performing reliably with a 1:1 interleave factor. Data transfer rates are rated at 2 Mbyte/sec.

The Keyboard

PC Brand ships its 386 computers with the Keytronic model EO3435 101-key keyboard. Keytronic keyboards are relatively quiet and have a solid feel, whether you have a feather-light touch or pound on them like a shoemaker. They cost about 50% more than competing products, but they're worth it.

Monitor

I received the Princeton Graphics Ultrasync monitor with the Paradise VGA card. The Paradise card is capable of duplicating the IBM PS/2 VGA graphics modes. The monitor has a lot of pluses. Horizontal and vertical con-

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print, desktop unit and the Powermate Portable SX is a transportable system that provides advanced desktop functionality. Both PCs feature clock speeds of 16MHz and 2MB of high-speed RAM. The base Powermate SX retails for $4,495 and the base Powermate Portable SX retails for $6,595. See the NEC Powermate SX and Powermate Portable SX at Booth #1758.

Sanyo Business Systems MBC-16LT And MBC-17 Plus

Sanyo will show their first laptop and a small footprint 16-bit, 10MHz, 80286 based PC.

The laptop is called the MBC-LT and uses a 8MHz 80C88 CPU. 640K RAM is standard as are two 720K 3.5" floppy disk drives. Featuring an adjustable, removable, 9" supertwist LCD screen, the MBC-16LT supports 80 columns x 25 rows in the text mode and has a resolution of 640x200. It comes standard with MSDOS 3.2 and GW-BASIC 3.2 with a suggested retail price of $1,599.

The 16 bit MBC-17 Plus has a standard configuration of 512K RAM which can be upgraded to 1MB directly upon the motherboard. Equipped with a 1.2MB 5.25" floppy disk drive, this system offers two additional half height slots that will accommodate both floppy disk drives and or hard disk drives.

With a serial and parallel port, this six expansion slot machine also comes with MSDOS 3.2 and GW-BASIC 3.2. The suggested retail price is $1,499. See both the MBC-17 Plus and MBC-16LT at Booth # 1954.

Scantech Computer Systems LCD-286 Portable PC

The LCD-286 Portable is a 20MHz 80286 based personal computer. Its standard features include an Intel 20MHz 80286 microprocessor, internal 20MB hard disk drive, 5.25" 1.2MB floppy disk drive, 80 column by 25 row, 9" electroluminescent liquid crystal display screen and one megabyte of fast zero wait state RAM. List price for the LCD-286 is $3,495. See the Scantech LCD-286 Portable at Booth #T412.

Software...Business Applications & Programmers Tools Borland International New Developers Tools

Borland will have their new series of developers tools including Turbo Assembler and Debugger, as well as upgrades to Turbo Pascal and Turbo C and new Runtime Library Source packages. See their complete line of microcomputer software products at Booth #1009.

FoundationWare Vacine Corporate

FoundationWare will show their Vacine Corporate enhanced anti-virus program, that provides multi-featured PC software protection and microcomputer management.

Maynstream 2200 HS 2.2 gigabyte tape backup system.

Vacine Corporate Version 2.1, prevents the use of unauthorized software on IBM and IBM compatible microcomputers, reduces data loss due to user mistakes and increases PC productivity, while continuing to protect systems from computer viruses, bombs and Trojan Horse software. VC works on PC, XT, AT, AT386 and PS/2 machines with a minimum of 384K RAM. It has a suggested retail price of $189. See the enhanced Vacine Corporate at Booth #T606.

Emerald Systems EmSAVE

Emerald Systems will be showing their EmSAVE new network data backup management software that operates on a new generation of cartridge and cassette tape backup subsystems called RapidRecover series.

The EmSAVE backup and restore utility is designed for LAN backup applications and stand-alone DOS. By using EmSAVE, LAN administrators who perform backup and restore functions of multiple fileservers can maintain centrally controlled archival tasks more efficiently.

Mitac Paragon 286 VE 16MHz 80286 personal computer.

EmSAVE application kits are sold separately. They include five data cartridges, a media storage case, software and documentation. Preliminary prices range from $350 for the cassette versions to $495 for the cartridge kits. Preliminary pricing of the RapidRecover series starts at $995. See the Emerald EmSAVE at Booth #H7144.

Lattice Highstyle And New C Compiler

Lattice will have their new High Style Desktop Publishing Package and new C Compiler at this years show. Highstyle is a complete document composition system that consists of a word processor, spelling dictionary, print formatter, page previewer, icon editor and snapshot utility. The utilities can each be used separately or can be integrated through the Highstyle access menu system. The $375 package price also includes many samples and pre-defined style guides, quick reference chart and comprehensive user's manual.

The new Lattice C Compiler Version 3.30 includes Lattice's own BIND utility and Applications Programming Interface (API) Library which allow developers to create family mode programs without purchasing an expensive OS/2 programmer's toolkit. Lattice is able to provide a single compiler and set of libraries which operate with both operating systems. This current release runs under DOS or OS/2 and will detect the environment it is running under and automatically generate the correct code for that machine. Registered users of Lattice MSDOS C Compiler will be able to obtain an upgrade to Version 3.3 for $75. For additional information and a demonstration see both products at Booth #R8704.

The Santa Cruz Operation SCO VP/IX

The Santa Cruz Operation will have their new SCO VP/IX Release 1.1 that also runs on the IBM PS/2 on display. Release 1.1 is a fully functional DOS under Xenix system for 80386-based computers running the SCO Xenix 386 Operation System. SCO VP/IX brings the most up to date DOS bridge to SCO Xenix 386 on ESDI, SCSI and IBM PS/2 platforms. SCO VP/IX is a multitasking, multi-user software extension to the SCO Xenix 386 Operating System that enables users to run both MSDOS and Xenix applications concurrently. The integration of the MSDOS and Xenix file systems is completely transparent. Stop by Booth #3&6 for a demonstration.

Software Publishing Corporation Announces PFS:First Graphics

First Graphics is a low priced presentation graphics program for the occasional graphics user. The new product features many of the capabilities of the company's award winning Harvard Graphics program and has a suggested retail price of $149. The program requires 320K RAM and DOS 2.0 or higher. It is available for the IBM PC, PC/XT, AT and PS/2s. See the PFS:First Graphics at Booth #A666.

Word Perfect Corporation Office And Word Perfect 4.2

The Word Perfect booth will have the new Word Perfect Office—an office automation package for PC LANs and the Word Perfect 4.2 for SCO Xenix System V.

Word Perfect Office is designed to increase productivity by streamlining inter-office communications. Office

continued on page 116

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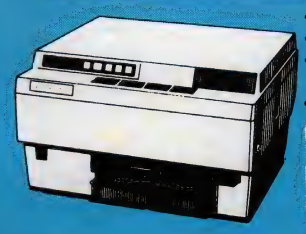

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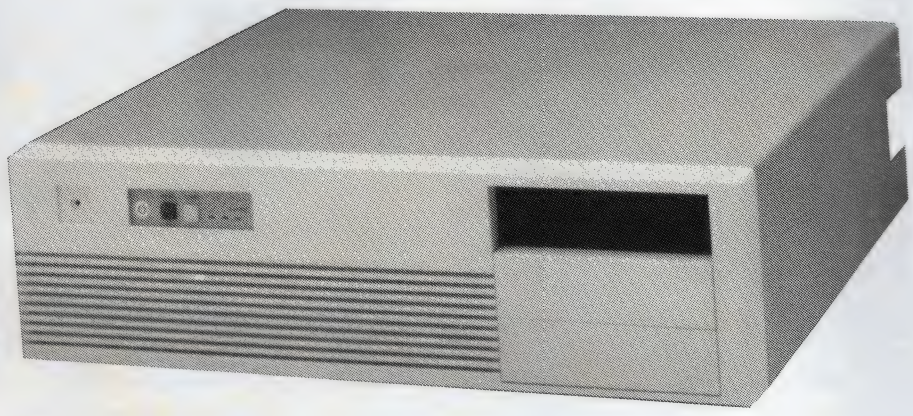

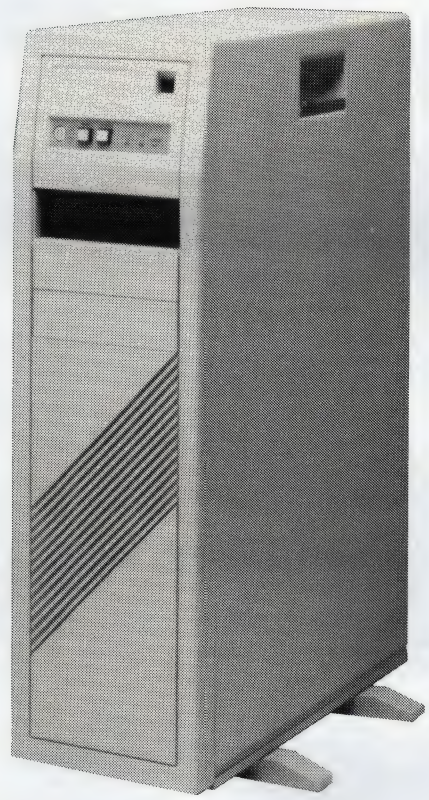

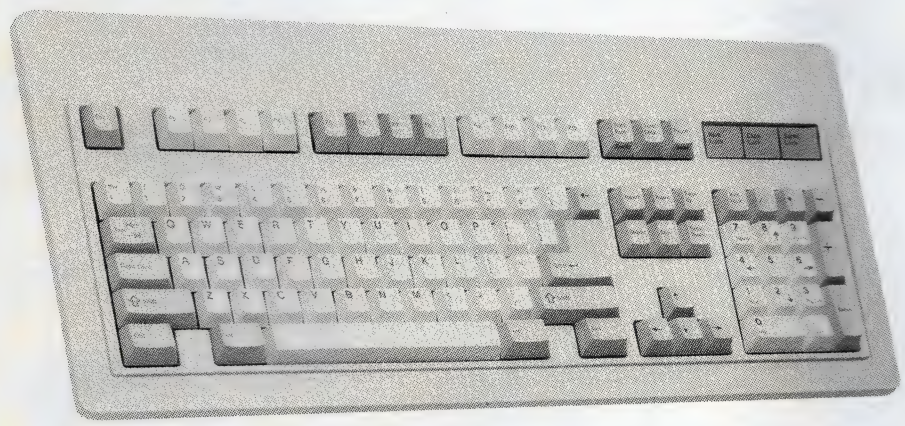

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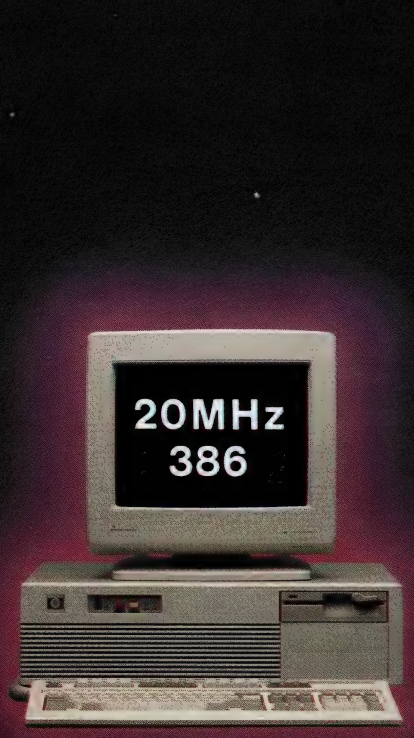

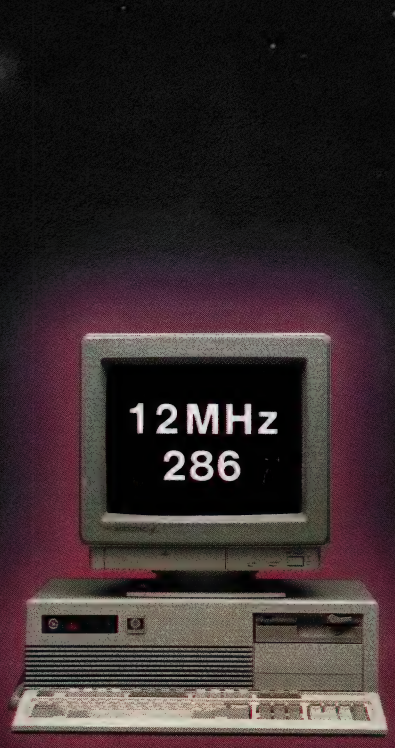

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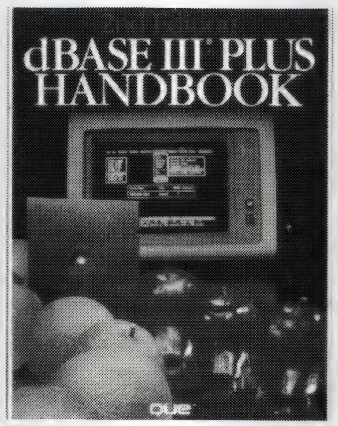

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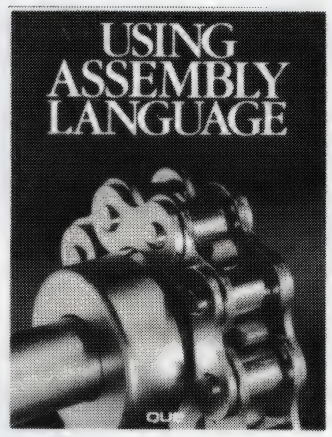

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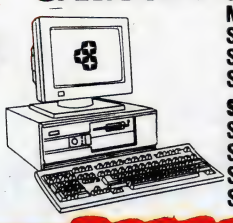

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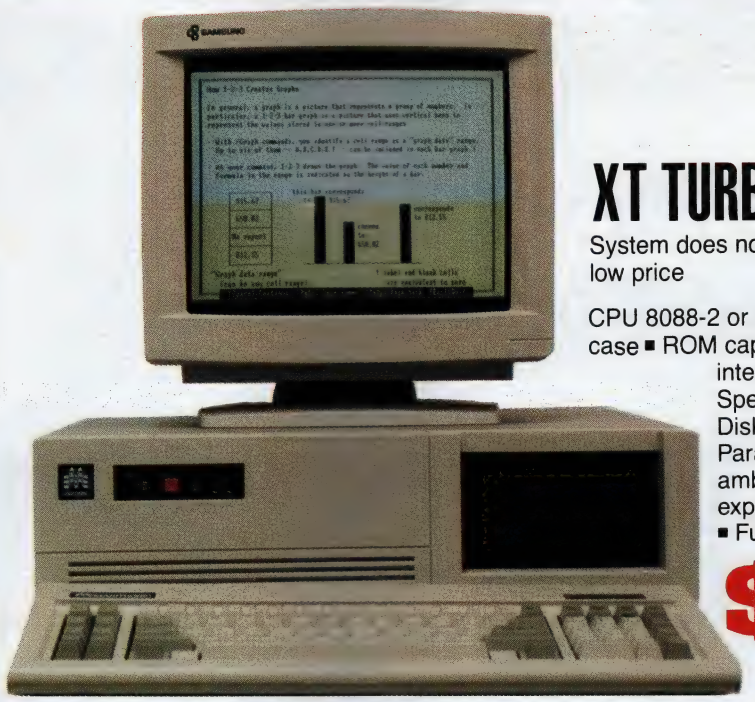

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standard networks, and co-exist with conventional ASCII or PC terminals.

In the category of DOS compatible operating systems, I will cover the following products: Concurrent DOS 386 MGE (for Multi-user Graphics Edition) from Digital Research, whose initial release version supports the SunRiver workstations; SmartScreen 386 from Concurrent Controls, an OEM version of Concurrent DOS 386, with support for the Viewport Technology hardware; PC-MOS/386 from The Software Link on the VNA hardware from Advance Micro Research; and FlexOS 386, also from Digital Research, which is a real-time operating system that bridges standard desktop computing with the ability to supervise data acquisition, process control, and factory automation. Its drivers support SunRiver, although future versions will support other hardware still in development.

In the category of PC/MSDOS control programs, there is Quick Connect from Virtual Systems. It supports the SunRiver platforms. Other hardware implementations are under consideration. The other operating environment is IGC's multi-user VM/386. This product was developed out their multi-tasking VM/386 edition and contains drivers for the Viewport graphics board.

UNIX is represented by SCO's Xenix 386 System V, and 386/ix and VP/ix (which allows DOS applications to run under UNIX) from Interactive Systems. The first multi-user graphics editions of these operating systems support the SunRiver and Advance Micro Research products. Ports are also in development and/or under consideration for the Viewport hardware.

How These Products Were Tested

As I stated earlier, I have been involved with some of these products since their early Beta test versions. During this time, I put together a testing lab consisting of a Kaypro 386, an Acer 1100/386, and a PC Brand 386, which were used as the host consoles for the SunRiver Fiber-Optic Terminals, and the Viewport and AMR graphics boards.

I focused my attention on the hardware and software installation, and the ability to run multiple graphics sessions concurrently. Graphics software, for the most part, under DOS, consisted of DRI's GEM-based applications, Ventura Publisher, a number of drawing programs, and the new 3-D MAXXI-CAD computer aided engineering program from CRTC, Inc. Software testing under Xenix was accomplished with a group of products provided by SCO (ImageBuilder, MultiView, etc.). Both SCO and Interactive Systems informed me that a full spectrum of graphics and computer aided engineering applications were tested with the SunRiver workstations to ensure complete compatibility.

Benchmarking the performance of multiple workstations was done with the Landmark and InfoWorld programs. I did not include a chart listing the benchmark results because I was limited to working with two and three-user systems. The speed performance factors mentioned in the multi-user hardware sections are only approximate, because the types of graphics applications and number of actual users will have a bearing on a system's performance. The speed of the computer is also important. A multi-user graphics system installed on the PC Brand 386 computer, which clocks in at 32MHz, benched almost twice as fast as the same system on a 16MHz Kaypro 386.

Multiple graphics running under Virtual System's Quick Connect on the SunRiver terminals.

386 System Requirements

The overall conclusions I reached were: Your host computer should be rated at a minimum of 20MHz. It should have an interleaved memory scheme using Static Column RAM instead of conventional DRAMs. Static Column RAM behaves similar to standard Static RAMs in that they retain old data until replaced by new data. Dynamic RAM (or DRAMs) must be refreshed in order to retain the charge, and will slow down a system's performance by as much as one or two wait states.

The host system should not contain a VGA graphics card, or monitor unless the operating system specifically supports this mode. You may be unable to load the operating system, or it may crash during the installation process.

You must also disengage any existing expanded memory drivers. All multi-user operating systems and control programs use the 8086 virtual mode to access expanded or paged memory. Expanded memory drivers were designed for single-user systems, and set up the protected mode of the 386 processor. The virtual and protected modes cannot be used concurrently.

Several late-model 386 computers have been tweaked to maximize CPU performance and disk throughput by the addition of a cache memory controller. Multi-user operating systems conflict with cache memory to an extent where performance will suffer, and some won't operate if cache memory is turned on. Select a 386 which allows you to disable cache memory on the motherboard through a jumper block or a DIP switch.

A 386 with the maximum number of open slots is the preferred host for a multi-user graphics system. Desktop publishing applications may require a scanner, which will eat up another slot, as will a network card, if the cluster will be linked to an office-wide network. The systems I worked with only had one or two slots available for hosting a multi-user graphics controller card, after taking into account the additional boards previously mentioned. This limits workstation groups to four or eight users.

If you need to stretch your multi-user graphics cluster to the maximum of 16 users, you should look into buying a file server, or a computer with at least 12 expansion slots. These systems usually have a passive backplane instead of a conventional motherboard. Choose a disk controller card that supports both hard drives and floppies, and which has a 1:1 interleave. Some 386 computers use separate controllers to push disk access to the limit, but in the process you lose a slot. Your hard disk drive should have a capacity of 80 or 130MB to provide large sub-directories and ample data storage for all users, as bit-mapped graphics tend to hog space.

You'll also need lots of memory. You should allocate a minimum of 1MB per user—even more if the operating system supports multi-tasking at the main console and/or the terminals. Choose the system that will allow you to add the maximum amount of memory per card. Memory cards that can hold 8MB are preferred.

The multi-user graphics solutions in this report offer state of the art hardware and software engineering, and full compatibility with any graphics software you may now be using on a single-user computer. They are relatively simple to install. Once the operating systems are in place, it's business as usual. Platforms which now only offer Hercules monochrome graphics will soon offer EGA versions. The EGA platforms will have VGA support available by the time you read this. I have been told that these are just stepping stones for future development. I'm rather inclined to believe them.

Summing Up

The products in this special *Computer Shopper* report were first unveiled in their early stages at the Spring Comdex in May, and at New York's PC Expo in June—either at the vendors' booths or at private showings. Even though the participants have been low-key in their announcements during the development stage, a very sizable ground-swell of interest has been generated by the business and VAR communities. By the time Fall Comdex in Las Vegas rolls around, these products will be in full release and will attract even a more diverse audience.

At the present time, the hardware platforms will only support the Intel 386 AT bus standard. The only firm currently developing a Micro Channel version for IBM's Model 80/386 computer is SunRiver. If IBM releases additional 386-based systems, and increases their installed systems base, then AMR and Viewport will design Micro Channel specific hardware as well.

Whatever hardware/operating system platform captures your interest, you are assured that they work together to open new vistas for desktop publishing, graphics design, and CAD/CAM applications. Although these solutions may seem expensive, they're cheaper than a VAX minicomputer or a dedicated Sun or Apollo engineering workstation.

Multi-user Graphics Hardware
The SunRiver Fiber-Optic Terminals

From a pure technology standpoint, the SunRiver Fiber Optic Station may well be the Rolls Royce of the multi-user graphics systems available today. SunRiver was founded in 1985 by four engineers and management executives out of Diversified Technology, a major supplier of single board computers for the industrial market. Most start-ups begin with small projects and grow into higher levels of technology. SunRiver led off with a leading-edge product in June, 1987 when the Fiber Optic terminals were released. It makes one wonder what they'll do for an encore.

Transmission between the 386 host system and the SunRiver terminal is rated at 32-Megabits per second through a duplex fiber optic cable. That's more

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SunRiver's EGA terminal with Fiber Optic Host Adapter card.

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than 3,000 times faster than a serial terminal communicating at 9600 baud. This means a full color bit-mapped graphics screen can be redrawn in 1/10th of a second. Another advantage that fiber-optic cables have over wire cables is that they are completely impervious to any kind of electro-magnetic interference, because the dielectric nature of optical fibers guarantees complete data integrity at all times.

A fiber optic cable has a core of light-transmitting material with a high degree of refraction, surrounded by a cladding or optical insulating material with a lower index of refraction. Light enters the fiber at an infinite number of angles, but only those rays entering the fiber at an angle less than the critical acceptance angle are transmitted. When a propagating ray strikes the core-cladding interface, it is reflected and zigzags down the core.

The optical fiber is a transparent material system that conducts or guides light. When data is to be transmitted, it is first converted into modified infrared light. The signals can be transmitted through a fiber either digitally (by pulsing the light), or in analog form (by varying the brightness of the light). When it reaches the other end, it is then reconverted into electronic signals.

The SunRiver Station consists of three components: a keyboard, a monitor with a base unit containing the system electronics, and a fiber-optic cable. A single half-sized 4-Port Fiber Optic Host Adapter can service four workstations. A maximum of 4 host adapters can reside within a 386 system. All systems are shipped with the Maxi-Switch ME-101 keyboard. This has the same kind of firm, smooth action that Keytronic keyboards have. Replacement keycaps are included that allow you to transpose the CAPS LOCK and CTRL keys. The CAPS LOCK key is next to the letter "A," and some typists are used to having the CTRL key in that position. A small rocker switch on the underside re-routes the appropriate scan codes when the keycaps are switched.

I received the SunRiver FOS-350/3 system for evaluation. This uses a Mitsubishi XC-1430C EGA monitor with a 640x350 16-color display that mounts directly to a tilt-swivel platform bolted to the base unit. Other available systems include the FOS-348 (a monochrome 720x348 amber display), and the FOS-480 (a multiscan display with 640x480 resolution). The graphics logic within the base unit will vary according to the type of display it supports.

The terminal logic board inside the FOS-350/3 base unit is built around the Paradise EGA graphics chipset and 256K of video RAM. The core logic is performed by a custom CMOS VLSI 80-pin gate array communications chip that handles the transmit/receive functions associated with fiber optic communications. It also supervises the I/O logic within the base unit, including two serial ports and a parallel port. The video display controller is the 6845. There is an unidentified keyboard controller with the Award BIOS logo on the label, which I've been informed is standard for all systems. There is no video BIOS on the board. All video BIOS implementations for the workstations is an integral part of each operating system, which allows the operating system to exploit the hardware.

Although the Host Adapter card requires a 16-bit expansion slot, it handles 8-bit communications. There are 8 pre-terminated ST bayonet connectors on the backplane labelled A0-3 and B0-3. An A and B connection is required for each workstation and the host adapter. One line receives, while the other transmits. If an EGA graphics card is installed in the host computer, the primary/secondary I/O address jumper has to be removed, and a cable has to be connected between the center post of the EGA card and the first SunRiver host adapter. This allows the host and remote graphics hardware to work synchronously.

What actually happens is that when each station requests processing power, time intervals are dynamically allocated in such a way that other users on the system aren't interrupted. Depending on who requests access, both graphics cards are shuttled in and out of primary and secondary device modes. The approach is similar to the time slicing of CPU time on standard multi-user systems, except that with the addition of multi-user graphics cards, the algorithms have become much more sophisticated and complex.

The following EGA cards are known to work with the SunRiver stations:

Compaq Enhanced Color Graphics
Genoa SuperEGA HiRes (4850-5)
Quadram Quad EGA+ (Long)
Quadram Quad EGA+ (Short)
Quadram Quad EGA Prosync
Paradise EGA 350
Paradise EGA 480
IBM Enhanced Color Graphics
AST 3G+
AST 3G+II

I did check out the compatibility factors with an ATI and a generic EGA board, and the systems functioned without problems. SunRiver's documentation provided the foregoing list, and indicated that the connecting wire goes to the "right" pin on the address jumper block for all cards except IBM's. The address jumper block is usually located in the upper right-hand corner of the EGA card. If you're unsure, check your documentation. This is a careless statement, because none of the EGA manuals I have floating around are very thorough.

SunRiver's preliminary documentation is a bit skimpy, but I have been assured that a new installation manual was in preparation. The most important section, as far as I was concerned, was the one dealing with conduits—that is, how to route the fiber-optic cable around corners. Since we are dealing with light transmission (digital signals that have been converted to pulses of light), cables must maintain a minimum 1-inch radius in order to bend the light rays. A number of useful illustrations are provided showing the right and wrong ways of handling various situations. Because the fiber-optic cable is about the same thickness as ordinary household lamp cord, it can be easily run under carpets or through false ceilings.

The SunRiver Fiber Optic system has a range of 1,000 feet between each station and the host. Cables are available in 25, 50, 100, 150, 250, 500, and 1,000 foot lengths. A total of 3 in-line connections are possible if you start with shorter lengths and then decide to increase the distances later on.

A variation on the SunRiver Fiber-Optic workstation was in Beta testing at this writing, called the PC Fiber-Optic Station Emulator Card. This card contains most of the essential electronics from the SunRiver terminal logic board. It can be plugged into any 8-bit slot in a PC or AT, and then connected to the SunRiver Fiber Optic Host Adapter in the host 386 computer.

The PC Station Emulator works in mysterious ways. In addition to having the dual bayonet connectors for the fiber optic cable, there is a special 25-pin "pig tail" cable that connects to the back of the board, which splits into three cables. One 9-pin tail plugs into your existing EGA card; another 9-pin tail plugs into your monitor; and the third tail provides serial output for your mouse or graphics tablet.

When a PC or AT is part of a SunRiver cluster, it can toggle between emulating a Fiber Optic workstation and as a stand-alone computer. SunRiver will be supplying a small TSR (Terminate and Stay Resident) program that with the PC Station Emulator card that will allow you to switch from one

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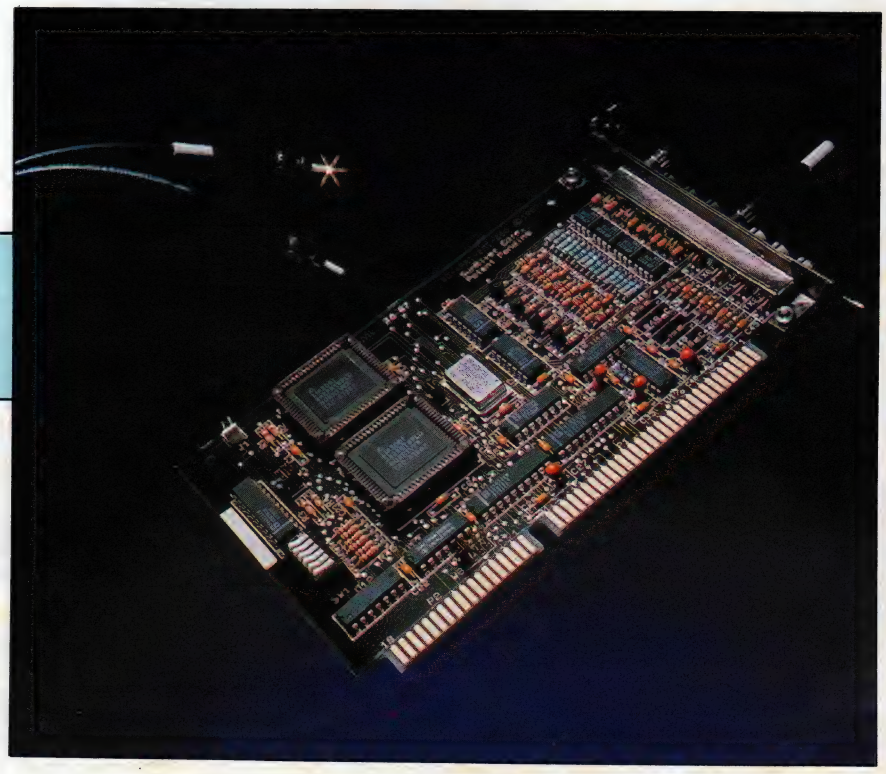
SunRiver's PC Station Emulator card turns a 286AT computer into a fiber optic terminal.



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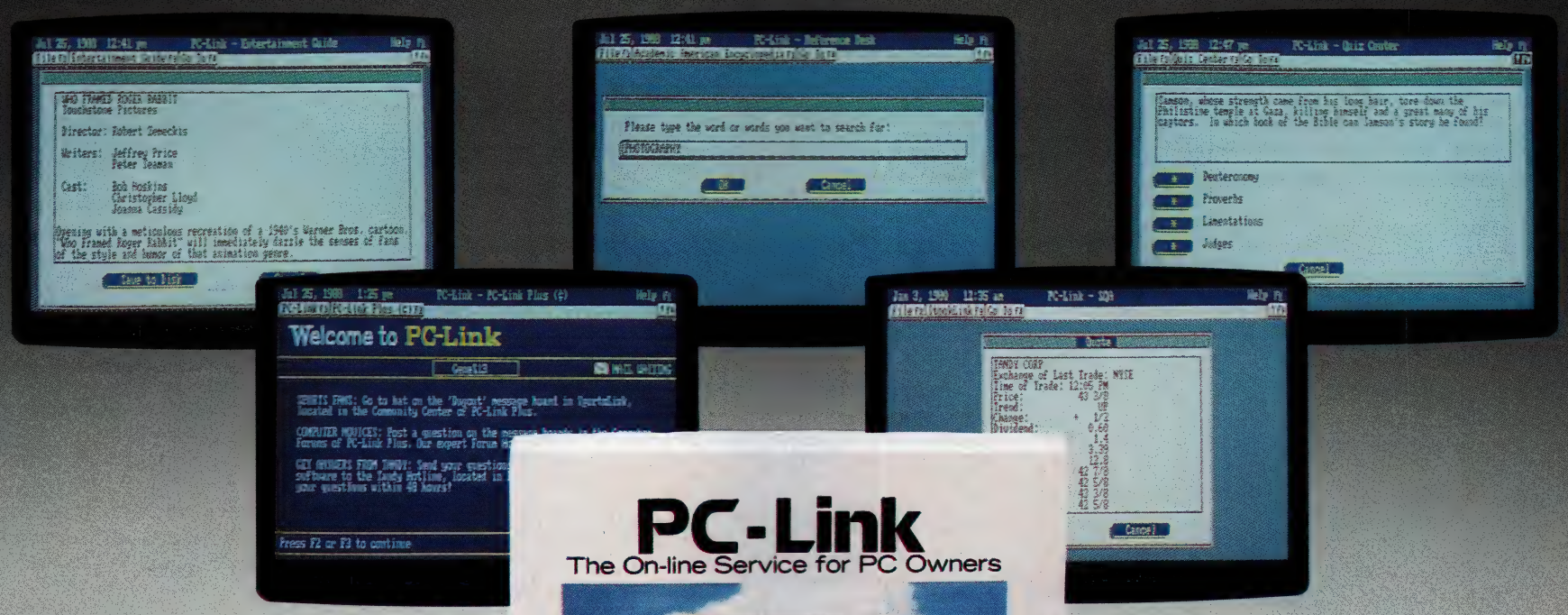
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Touchstone Pictures
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Writers: Jeffrey Price
Peter Seaman
Cast: Bob Hoskins
Christopher Lloyd
Joanna Cassidy
Opening with a meticulous recreation of a 1940's Warner Bros. cartoon, "Who Framed Roger Rabbit" will immediately dazzle the senses of fans of the style and humor of that animation genre.
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PC-Link - Quiz Center
Samson, whose strength came from his long hair, tore down the Philistine temple at Gaza, killing himself and a great many of his captors. In which book of the Bible can Samson's story be found?
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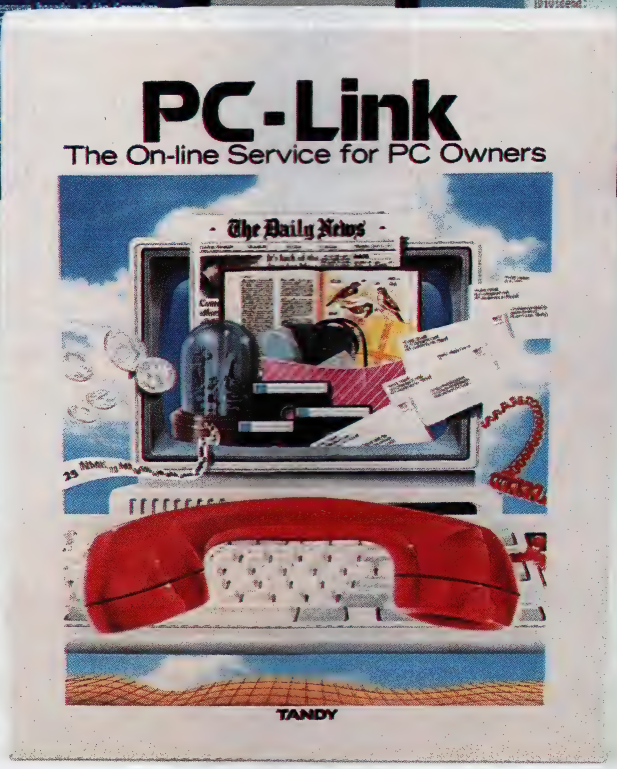

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mode to another through a "hot key" switcher. All multi-user operating systems will see the AT as just another SunRiver terminal and communicate with it on this basis.

Since you're able to utilize existing hardware, your entry cost is greatly reduced. Any combination of terminals and PCs with emulator cards can be used to make up a multi-user graphics system.

Data transmission through the fiber optic network is practically instantaneous, and because the stations are writing directly to video RAM, the SunRiver terminals will operate at an effective speed of 10-12MHz when connected to a 20MHz host 80386 computer. With the new 25MHz systems, performance will be even faster. This speed will vary according to system overhead, such as the number of users, type of graphics applications, and whether multi-tasking is supported on the host or remote stations.

The workmanship of this product is impressive, as is its performance. The host adapter card is shipped with a DOS format diagnostic diskette. This allows you to check out the host adapter and any remote terminals if hardware related problems are suspected. The SunRiver workstations are sold only through selected dealers and Value Added Resellers (VARs), who will be offering the individual component hardware and operating systems for end-user installation, as well as completely configured turnkey systems.

SunRiver's Monochrome station (FOS-348) lists at $1,399. The FOS-350/3 EGA is $1,999, and the FOS-480 EGA + Autoscan is $2,299. The 4 Port Host Adapter (AT-40) is $799. The estimated price for PC Fiber Optic Station Emulator board (as of August) is $850. Prices have yet to be established for the forthcoming VGA workstation, and for the Micro Channel version of the host adapter card. Fiber-optic cables begin at $110 for a 25-foot length. The 1,000-foot length is $1,257. These costs are less than standard Ethernet cables. Multi-user operating systems ported to SunRiver's workstations can be integrated into existing office LANs, and provide a four-fold performance factor.

The Video Network Adapter From Advance Micro Research

Unlike the SunRiver approach which places the graphics display logic within neatly packaged terminals, AMR's Video Network Adapter (VNA) has taken a reverse route. The graphics logic for remote terminals emanates directly from the adapter card that plugs into a 16-bit slot on the 386 host computer's motherboard, because it takes control of the system bus. Remote terminals are created by plugging any TTL-level monochrome monitor and IBM compatible keyboard into a small multiplexer device called the Interface Unit.

The system I worked with supported Hercules monochrome graphics on the host system and on the remote terminals. As I complete this article, a VGA version of the Video Network Adapter was just going into a limited Beta test release. The VGA card is scheduled for distribution early in the 4th quarter of 1988. AMR is by-passing the EGA level primarily because IBM and Compaq have dropped it for the higher resolutions offered by the VGA standard.

While the VNA offers a lower-cost alternative to the SunRiver approach, there are some drawbacks to using this hardware at the remote workstation. It doesn't directly support local I/O ports for mice, modems and printers. However, you can use Lotus 1-2-3's graphics mode for creating charts, and a host of word processing programs that support a graphics-based WYSIWYG display. In this respect, the VNA is far superior to what you can run on an RS232 ASCII terminal.

VNA is only supported by one DOS-compatible multi-user operating system. The Software Link has secured the exclusive marketing rights to this product for the DOS market. When I became aware of this product early in 1988, Concurrent Controls and Virtual Systems were in the process of writing drivers for the VNA. The Software Link indicated that it would make the VNA available to VARs for integration with other DOS-compatible operating systems. However, not wanting to deal directly for hardware with a competing operating systems developer, both Concurrent Controls and Virtual Systems shelved their products.

On the other hand, the UNIX market is wide open. Operating system support is available from Interactive Systems for its 386/ix and VP/ix products. The Santa Cruz Operation is developing a VNA driver for their SCO Xenix 386 SYSTEM V operating system (which already has a SunRiver driver).

The VNA multi-user graphics adapter replaces the graphics card in your 80386 computer. It emulates a Hercules compatible adapter. This host adapter has a DB-37 socket on the backplane which interfaces with a 4-port Translation Unit through a short shielded cable. There are four DB-25 connectors on the Translation Unit. It serves the role of a signal splitter and feeds the monochrome and keyboard signals to the remote Interface Unit boxes. AMR calls this component group the Base VNA System. A 9-volt AC adapter is included to power the Translation Unit.

The host's monochrome monitor has to be connected to one of the DB-25 port connectors on the Translation Unit. A converter cable comes with the Base VNA System that feeds the monochrome monitor signals to a 9-pin female plug. The Translation Unit measures 7 5/8"x3"x1¼" and the Interface Unit is 4¼"x3"x1¼". Although double-backed tape can be used to secure the Interface Units to the back of a desk to remove them from the work area, small brackets attached to the ends would be more secure.

Adding remote stations requires the purchase of a User Upgrade kit which consists of an Interface Unit (into which a monitor and keyboard are plugged to create a terminal), a 9-volt AC adapter, and a daughter card that mounts on the host adapter card. This daughter board is, essentially, a miniature Hercules compatible graphics card.

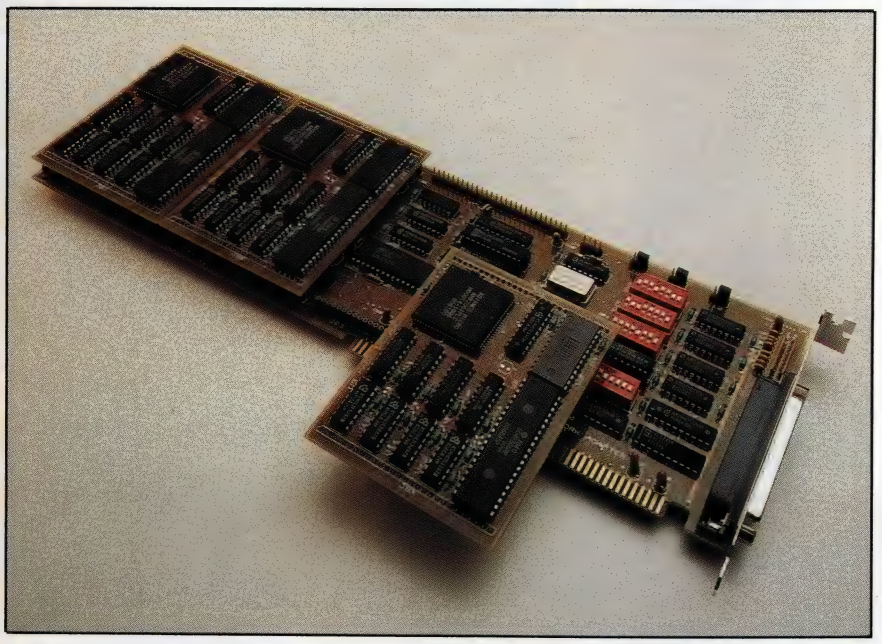
Three of these cards can be piggy-backed to the host adapter. A 28-pin SIP plug and a 28-pin SIP socket are at opposite ends of each daughter board and ensure that they cannot be mounted the wrong way. The Interface Unit is connected to the Translation Unit through a standard DB-25 serial cable. The maximum distance this configuration supports is 500-feet.

Hercules monochrome graphics emulation is provided by a single CMOS gate array logic chip. The only other chips are an Intel 2732 PROM, a 6845 video controller, five TTL logic drivers, and 128K-bytes of video RAM. The logic in the Interface Unit is equally simplistic, containing only a handful of TTL driver/decoders for the monitor and keyboard signals. AMR calls their hardware solution the UN-Terminal. It is, however, still a terminal, whether the video logic is at the remote station or in the host computer.

A feature that wasn't documented in any of the literature I received with the hardware, concerns the second 37-pin connector on the Translation Unit, which is marked "Serial." It is used in conjunction with a special adapter card that can be plugged into your computer next to the VNA host adapter. A cable connects from the back of this board to the Translation Unit, and feeds the appropriate signal lines to an extra 9-pin connector on the Interface Unit. This can be used either for a modem or a mouse. The cost of this board is $399. Each VNA host adapter system requires its own serial adapter card if mouse support must be provided for all users. In this likely event, an 8-user system will require 4 slots on the motherboard.

The Video Network Adapter provides near AT-level performance because each remote terminal writes directly to its own video RAM. While access to video RAM is instantaneous, as it is with the SunRiver fiber-optic terminals, CPU processing requirements effectively slow down remote terminal operations proportionate to the number of users on the system. With 4 to 8 users operating at 8MHz on a 20MHz host computer, this hardware platform is still twice the speed of an Ethernet network. The VNA system will support a total of 4

continued on page 59



The Monochrome Graphics Adapter with multi-user daughterboards on Advance Micro Research's Video Network Adapter system.

Advance Micro Research's VNA Translation and Interface Units that host local monitors and keyboards.

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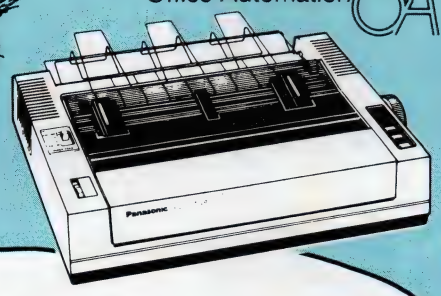

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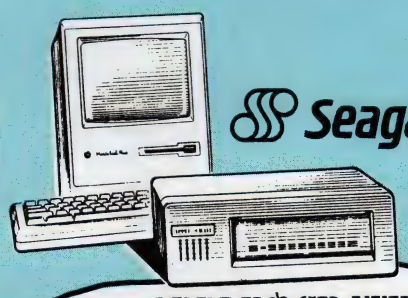

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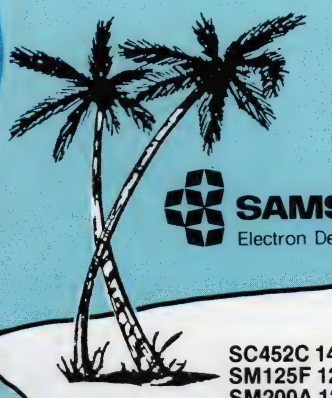

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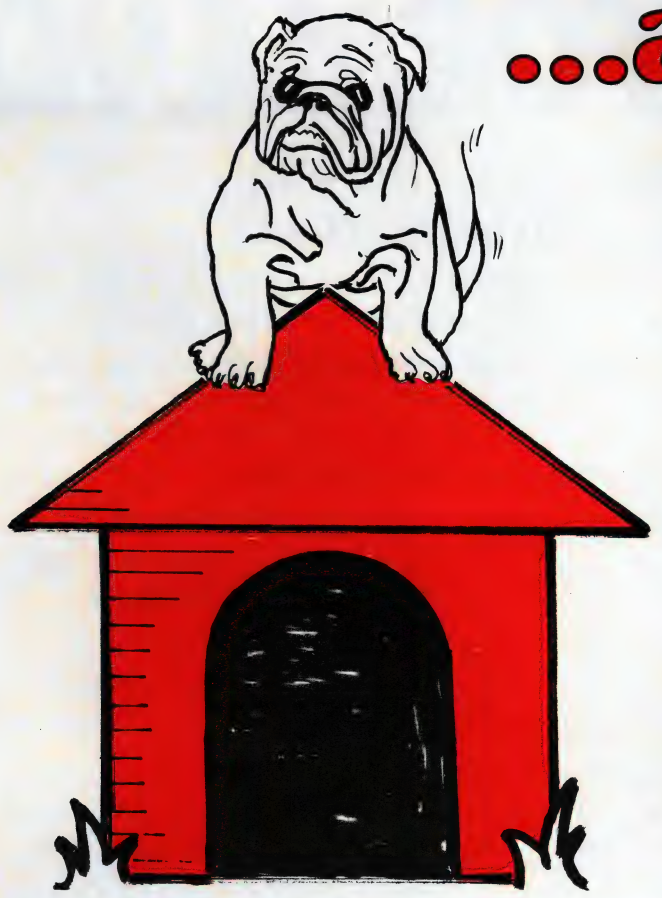

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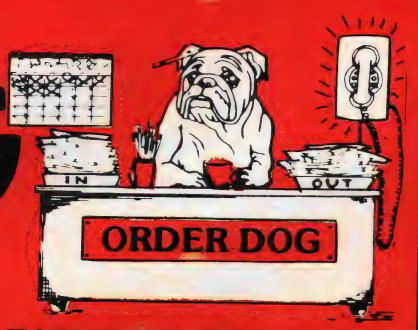

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- I/O PORTS BUILT ONTO THE MAINBOARD (2 SERIAL, 2 PARALLEL, 1 GAME)
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- TURBO AND RESET BUTTONS
- LED INDICATOR LIGHTS
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- (1) 1.2 MB FLOPPY DISK DRIVE
- DUAL FLOPPY CONTROLLER CARD
- 200 WATT SWITCHABLE POWER SUPPLY
- ENHANCED 101 KEY KEYBOARD
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- Swan Setup & Utilities Diskette, Full Documentation

Options:

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- 8087 Coprocessor
- SWAN/MS-DOS (3.3) add $89

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* Includes Single 360K Floppy Drive
† Add $49 For 14" Flat Screen Monitor

SWAN 286/10

$849 *Monitor not included*

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- 80286 10/6 MHz Norton SI 11.2
- Phoenix BIOS V 3.1
- 512K of RAM Expandable to 1MB
- 200W Power Supply
- 1.2MB Floppy Drive
- Ports: 1 Serial, 1 Parallel, 1 Game
- Dual Floppy/Dual H.D. Controller
- 8 Expansion Slots, 6x16 bit, 2x8 bit
- 101 Key, Touch & Click Keyboard
- Clock Calendar w/Battery Backup
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Options:

- 80287 Coprocessor
- Upgrade to 640K or 1MB
- SWAN/MS-DOS (3.3) add $89

286/10	VIDEO OPTIONS			
Drive Options	Mono†	CGA	EGA	VGA
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w/40MB Seagate #ST-251 HD	$1399	$1569	$1798	$1898
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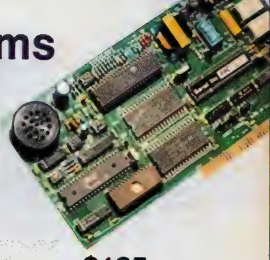

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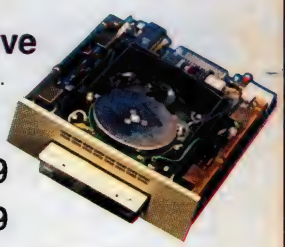

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- 1MB (expandable to 2MB)RAM on memory card
- 80287 & 80387 Coprocessor Socket
- 200W Power Supply
- 1.2MB Floppy Drive
- Ports: 1 Serial, 1 Parallel, 1 Game
- Dual Floppy/Dual H.D. Controller
- 8 Expansion Slots
- 101 Key, Touch & Click Keyboard
- Clock Calendar w/Battery Backup
- Swan Setup & Utilities Diskette,Full Documentation

Options:

- Upgrade to 2MB
- 80387 Coprocessor
- SWAN/MS-DOS (3.3) add $89

386/16	VIDEO OPTIONS			
Drive Options	Mono	14"Flat Mono	EGA	VGA
Single Floppy	$2199	$2168	$2518	$2618
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w/80MB Seagate #ST-4096 HD	$2799	$2848	$3198	$3298

SWAN 386/20

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- Phoenix BIOS V 3.1
- 1MB (expandable to 2MB)RAM on memory card
- 80287 & 80387 Coprocessor Socket
- 200W Power Supply
- 1.2MB Floppy Drive
- Ports: 1 Serial, 1 Parallel, 1 Game
- Dual Floppy/Dual H.D. Controller
- 8 Expansion Slots
- 101 Key, Touch & Click Keyboard
- Clock Calendar w/Battery Backup
- Swan Setup & Utilities Diskette,Full Documentation

Options:

- Upgrade to 2MB
- 80387 Coprocessor
- SWAN/MS-DOS (3.3) add $89

386/20	VIDEO OPTIONS			
Drive Options	Mono	14" Flat Mono	EGA	VGA
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- 512K of RAM Expandable to 1MB
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- 200W Power Supply
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- Ports: 1 Serial, 1 Parallel, 1 Game
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- Swan Setup & Utilities Diskette,Full Documentation

Options:

- 80287 Coprocessor
- Upgrade to 1MB
- SWAN/MS-DOS (3.3) add $89

286/12	VIDEO OPTIONS			
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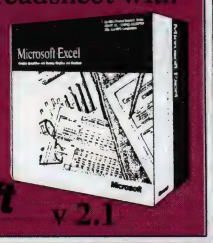

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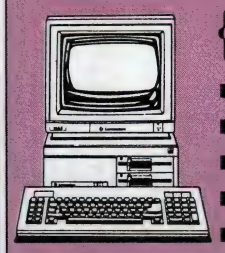

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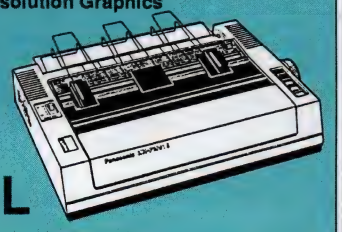

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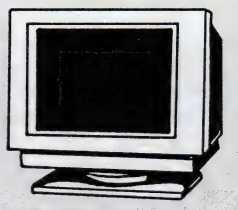

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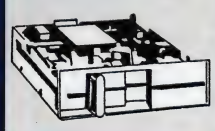

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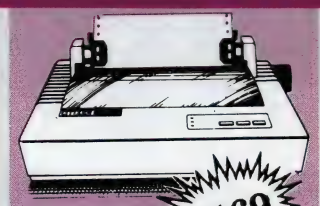

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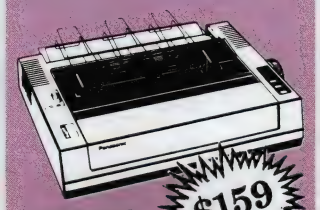

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Multi-User
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host adapter cards and up to 16 users.

Four DIP switches on the host adapter must be configured to set the interrupt vector, the video display buffer, number of users, I/O addresses, and interface registers for each board and each user. The host adapter supports bank switching which is implemented by the operating system. AMR supplies a 22-page Video Network Adapter Installation Guide with each Base VNA System. It is quite readable and the installation procedures are simple and direct.

Connecting all the boards, boxes, cables, and transformers is very basic. The section covering DIP switch settings gets a bit complex at times and should be read over several times so that you understand how to configure a multi-user system.

Several pages are also included on implementing the VNA driver for the PC-MOS/386 operating system from The Software Link. This is not for the inexperienced, and a thorough knowledge of PC-MOS/386 is required.

The Software Link distributes the VNA hardware and operating system through their licensed dealers and VARs in a special 4-user package for $2995. The cost of monochrome monitors and keyboards must be added to this in order to evaluate the total cost of a 4-user system.

Additional Base VNA Systems cost $745, and User Upgrade kits cost $379 each (plus monitors and keyboards). Shielded D-type cables to connect the base systems to the remote boxes cost about $1.00 per foot. AMR markets these components directly to dealers supporting the UNIX market.

The VGA edition of the Video Network Adapter uses a more compact topography. The host adapter provides for two users. Connecting cables go directly from the back of the board to Interface Units, bypassing the need for a Translation Unit. VGA monitors and keyboards plug into the remote boxes. A mouse port is also provided. The list price for the 2-user VGA system is $1,499. The Software Link will also be the distributor to the DOS market for this product, and AMR will sell direct to resellers supporting the UNIX market. Drivers are available for SCO Xenix and Interactive Systems' 386/ix and the VP/ix environment.

The Multi-User Graphics System From Viewport Technology

This product was originally in development for more than a year by Intelligent Graphics Corp. (better known as IGC), but was acquired by Viewport Technology in May of 1988.

IGC was launched in 1985 as an engineering firm that specialized in high-resolution graphics cards for CAD/CAM applications. The founders had previously started a company that manufactured color graphics terminals for the minicomputer market, which was ultimately sold to Western Digital. Early in 1987, IGC acquired the technology and the engineering team from Softguard that had been working on a DOS-compatible multi-tasking control program which had its roots in IBM's 3270 virtual machine operating system.

Even before VM/386 was released, a multi-user version was in development, that was to be used in conjunction with a new multi-user graphics board-level system from IGC's hardware division. Being directly involved with both multi-user operating environments and multi-user graphics hardware created a product conflict which made it difficult to move both products to other platforms. As a result, IGC sold their hardware division to Viewport Technology.

Since this split occurred, Viewport's multi-user graphics hardware is moving to a variety of DOS compatible and UNIX operating systems by Concurrent Controls, The Software Link, the Santa Cruz Operation, and Interactive Systems. Viewport Technology has also initiated a major development program that will produce at least five different multi-user graphics solutions over the next six to eight months.

The Multi-User Graphics Workstation System consists of a Host Controller that resides on the bus of a 80386 host computer. It is attached to the Station Controller by a system cable. The Station Controller provides the interface to a local monitor, keyboard and selected peripheral devices.

The Host Controller is a full size board designed to be installed on an AT type bus. It embodies five system functions. The Bus Interface system controls the bus for the management of the various workstation devices. The Graphics Device Management system provides the actual graphics capability, as well as the appropriate video memory. The Device Management system integrates and controls the performance of the peripheral devices assigned to the separate workstations. The Signal Integration system takes the input from the two Management systems, integrates them and provides an output to the Communication Delivery system. The Communication Delivery system, which includes the output connector for the controller, allows the output to be delivered to the remaining portions of the system over long distances.

The system cable is standard 25 wire (twisted pairs) cable with connectors on both ends, or non-terminated on one end to facilitate in wall installation. An unassembled connector is provided for termination.

The Station Controller is a compact (6"x4.5"x1.5") device, into which the workstation monitor, keyboard and other peripheral devices (mouse, drawing tablet, modem, or serial printer/plotter) are connected. The Station Controller has two system functions. The Signal Differentiating system takes the input signals and separates it into the respective elements. It then takes those elements and delivers the output to the respective output devices (keyboard, monitor, etc.).

Four EGA Host Controllers can reside in the main console, allowing a maximum of 8 users. Remote Station Controllers can be located up to 200 feet from the host system. The performance level of the Multi-User EGA is compatible with an 8MHz AT when running on a 20MHz host computer. Like the other multi-user graphics solutions, this norm is subject to variation based on the number of concurrent users and the type of graphic applications.

The first host adapter card in the main console can be configured in several ways. You can have an active host plus one remote user; a passive setup allows for two remote EGA stations, with the main console accessing a monochrome card. An alternative passive approach would have two EGA stations connected to a 386 network file server.

When the multi-user EGA host adapter is installed, any existing graphics card has to be removed, because the Viewport hardware takes complete control of the system bus. The EGA monitor plugs into one of the remote station boxes, although the keyboard can remain attached to the host's motherboard. Serial I/O for the host user also emanates from the computer. In the passive setup, however, the monochrome card for the host system can be retained if it is jumpered as a secondary device to the primary multi-user EGA card.

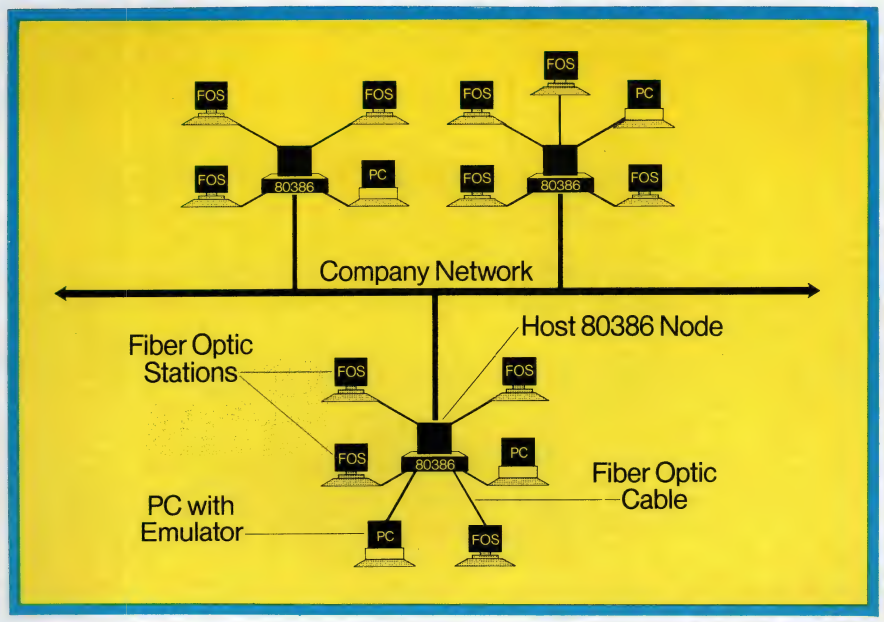
The Multi-User EGA Host Controller was designed around the Chips & Technology EGA chipset. The board contains two completely separate EGA circuits, each with its own bank of 256K static column video RAM.

The only prices I was able to obtain are the dealer/VAR cost of $995 for a 2-user host controller. Station controllers are $199 each. This system is shipped with two 15-foot shielded cables. Extension cables with both ends using D-type connectors cost approximately $1.00 per foot. End users can expect to pay about 10-35% above these costs, based on competitive situations, and what kind of additional hardware and operating system software is bundled with a turnkey system.

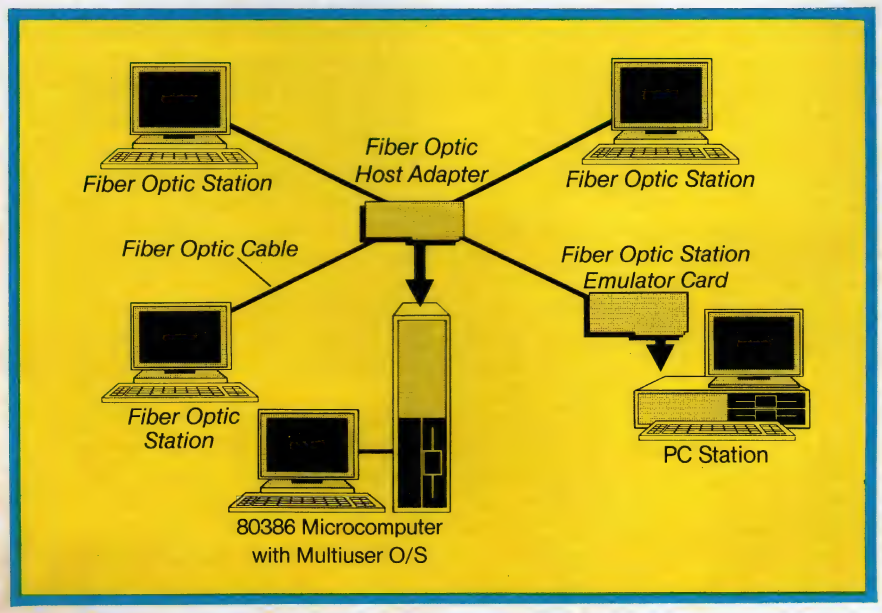
Viewport will be releasing a second generation multi-user graphics card late in 1988 that will support 4 users per host adapter. The design concept for this product will be radically different from their current offering, because it will incorporate custom CMOS gate array logic to replace the densely packed TTL logic.

A 4-user monochrome graphics host adapter is due in October, 1988. The anticipated list price for this product will be $900, which will make it the most cost effective multi-user monochrome graphics system available. A Multi-User VGA system is also in development. IBM PS/2 Micro Channel support is under consideration, but no decision on this version will be made until early in 1989. Also scheduled for release will be a graphics co-processor board and a multi-tasking graphics

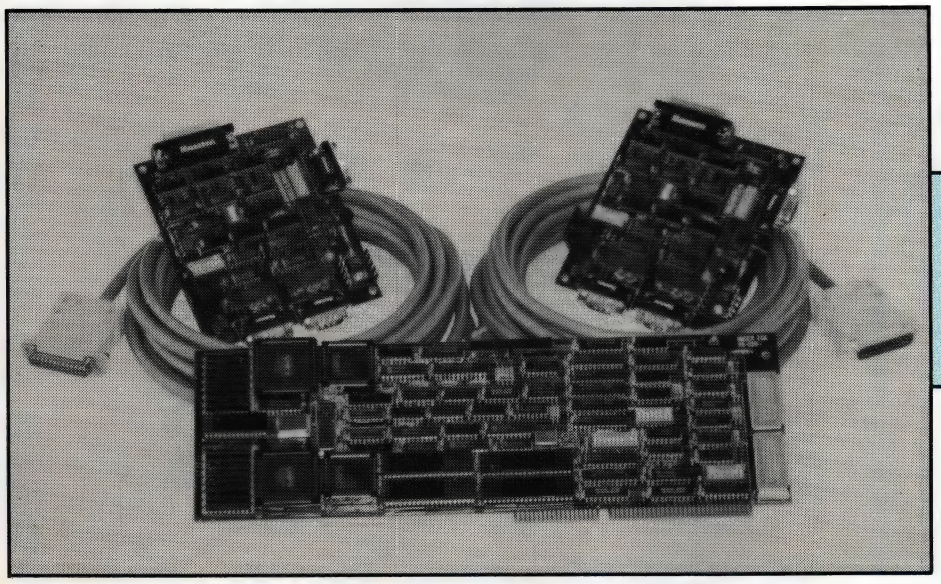
continued on page 60



SunRiver workgroups on a corporate network.



A SunRiver multi-user cluster.



Viewport Technology's Multi-User EGA Workstation System: The Host Controller card and the Station Controller card removed from its case.

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board with some exciting workstation applications.

All of Viewport's multi-user graphics boards are being designed with a family relationship. This means both monochrome and EGA (and later VGA) multi-user graphics boards can reside in the same 386 host. Since not all applications in a business environment require color output, significant cost savings can be realized by the ability to mix these two multi-user graphics environments.

Multi-User Graphics Operating Systems

The operating systems are grouped into three distinct categories: PC/MS-DOS compatible multi-user operating systems, DOS compatible control programs, and UNIX/Xenix. I have chosen this format so that you will have some way of comparing features within specific environments. Bear in mind, however, since each hardware platform has unique capabilities, direct comparisons between different operating systems using different graphics engines are difficult. This principle can be extended to the same operating system on different graphics hardware, and competing operating systems on the same hardware.

Basically, if an operating system supports multi-tasking on the host and at the terminals under one hardware platform, it may not do so on the next. There are operating systems and hardware that don't support multi-tasking, and some that multi-task on the host but not at the terminals.

DOS Compatible Operating Systems
Concurrent DOS 386 MGE
From Digital Research

Concurrent DOS, which has been evolving for more than a half-dozen years, has become very powerful and sophisticated in the past two years. The MGE (Multi-user Graphics Edition) version incorporates some important capabilities that will be included in the next release of the standard serial version.

The MGE edition finally incorporates a virtual machine environment within the architecture. A virtual machine environment delivers superior run-time performance for tasks that run in the background. This has been a particular problem when data transfers were made through high-speed modems (which sometimes drop data bits), or when a communications program bypasses the BIOS and writes directly to the serial port.

CDOS 386 MGE debuts on the SunRiver Fiber-Optic system. It will also support SunRiver's Fiber-Optic PC Station Emulator card which is due in the fall of 1988. The marriage of this hardware and operating system exploits the abilities of both environments in some exciting ways.

Since Concurrent DOS is a multi-user and multi-tasking operating system, the MGE edition will multi-task up to four EGA graphics applications on the host console, and up to four multi-tasking consoles on each of four SunRiver terminals. Providing there is enough RAM in the host computer, 20 graphics applications can run concurrently. The operating system comes pre-set with two virtual consoles configured for each terminal. Users can go into the Setup window and turn on additional virtual consoles as needed. A minimum of 8MB is recommended for systems with four SunRiver terminals. This will give you enough for 4 virtual consoles on the host, and two virtual consoles on each terminal, providing that none of the applications require expanded memory.

As with other Concurrent DOS editions, the MGE is self-installing. CDOS automatically performs a hardware check of your system and writes this information into the kernel. Since CDOS has a DOS compatible command structure, both PC or MSDOS and CDOS can reside on the same hard disk partition. A LOADSYS file allows you to boot either when the computer is turned on. For maximum flexibility, hard disks formatted under CDOS enable you to create partitions as large as 256MB.

The initial release of CDOS 386 MGE will only support a single host adapter card and 4 SunRiver terminals, and their respective serial and parallel ports. The next release or two will implement support for 4 host adapters and 16 users. Considering the amount of memory that would be required, no existing 386 computer can support 68 multi-tasking windows at one time.

When I asked DRI why they were only supporting 4 terminals in the first release version of MGE, when other operating systems were supporting two and four host adapters, I was told it was because they wanted to get the product to market in a timely manner. In further discussions, some other facts came to light.

Their software engineers have been rebuilding the kernels of CDOS-XM, CDOS 386, FlexOS 286 and 386, and DR DOS, so that the nuclei of all these operating systems have a family relationship. This will allow enhancements developed on one operating system to be ported to the others with only minimal engineering. The virtual machine environment that is now part of the CDOS 386 MGE edition came out of the FlexOS 386 development technology. The graphics drivers built into the MGE kernel are being moved to FlexOS.

The ultimate goal is to build a series of operating systems that can cover the full spectrum of single and multiple users, multi-tasking, and high-end real-time operating systems. This will provide OEMs and VARs with the tools to integrate more than one operating system into large office and manufacturing computing environments.

I think DRI has seen a wedge develop in the IBM and Microsoft DOS and OS/2 software compatibility platforms, and it intends to capitalize on this in a big way. To counteract the problem-plagued Windows and Presentation Manager interfaces, they will be releasing this fall the X/GEM multi-tasking graphics interface. Consistent with their policy of not discussing new product concepts until they are very close to being released, they are being close-mouthed about X/GEM and the impact it will have not only on their own multi-user operating systems, but on other operating systems as well. I was able to worm some facts on X/GEM out of DRI at the last minute, which I have included in the FlexOS 386 section.

The SunRiver terminal serial ports can be used for a mouse and a serial printing device or modem. Baud rates for the serial ports can be established through the Setup window. The MOUSE.COM driver included with the MGE edition is compatible with the Microsoft mouse driver, but Digital Research recommends using the Logitech mouse for total compatibility.

Applications that can run in banked memory can automatically access expanded memory as needed. Certain programs like AutoCAD will try and steal all available system memory if left unchecked. Using Setup, maximum memory per process can be set. Most well-behaved programs will always try to contain themselves within reasonable memory limits. The PIFED utility (the Program Information Editor) can be used to read and alter a program's run-time environment.

DRI has included a DOS COMMAND.COM emulator called CDOS.COM for specific programs that look for the DOS command processor when they load. CDOS.COM can be renamed COMMAND.COM if necessary. You can run TSR (Terminate and Stay Resident) programs by first loading CDOS.COM and then loading the TSR program. TSR programs can be run in any virtual console on the host and on the terminals. A variety of sophisticated utilities that set MEMSIZE, LIMSIZE, keyboard polling, stop running applications without rebooting, can be called into play as the need arises. When users turn on the expanded memory features through Setup, they will be able to move the TPA (Transient Program Area) from about 400K to 592K. This was made possible through the operating system's ability to dynamically move the BDOS, the disk buffers and other routines into a protected area of high memory. Applications that can bank beyond 640K will still have access to free memory above the TPA limit.

The MGE edition includes the FILE MANAGER, a DOS shell that allows you to invoke most system commands through menus. The operating system defaults to the command mode. The File Manager can be invoked by striking the F2 function key. Function keys can also be used and assigned to perform numerous system functions such as performing an instant CHKDISK.

The MGE includes the Window Manager, an advanced windowing system that allows you to size the virtual consoles and then overlay them on the screen. These console windows can be toggled between full screen size and window size with a hot-key switcher. The Window Manager will automatically write batch files for each window, when you size and position them on screen, as well as the background and foreground colors you selected during the setup. Altering these values only takes a few moments.

A key feature of CDOS is that in addition to running standard DOS applications, software can be written or compiled to take advantage of its native functions. A rash of development software and languages from Metaware and Lattice this year will help to increase the base of 1500 plus native CDOS application software packages.

CDOS native mode is capable of supporting shared program code, something that PC/MS-DOS can't. Shared program code means that an application is loaded only once into memory, and then accessed by all other users on the system. Users only need memory partitions sufficient to hold the data files—which may be as little as 100K. Since DOS .EXE files can't support shared program code, they automatically load duplicate copies of themselves into each user partition. This can run from 384K to 512K, depending on the requirements of the program.

Digital Research is heavily commit-

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ted to merging its operating systems with graphics capabilities, and an interesting series of products are slated to appear in the next year in conjunction with new graphics hardware that is currently in the non-disclosure stage.

CDOS 386 MGE is strictly a retail product which is sold only through authorized resellers and VARs. It is not presently known at this time whether it will be made available on an OEM basis as the standard editions of Concurrent DOS. As I mentioned earlier, I suspect that DRI will provide all the hooks and utilities so that their VARs can do their own software engineering for custom OEM applications. List price of the MGE edition is $995.

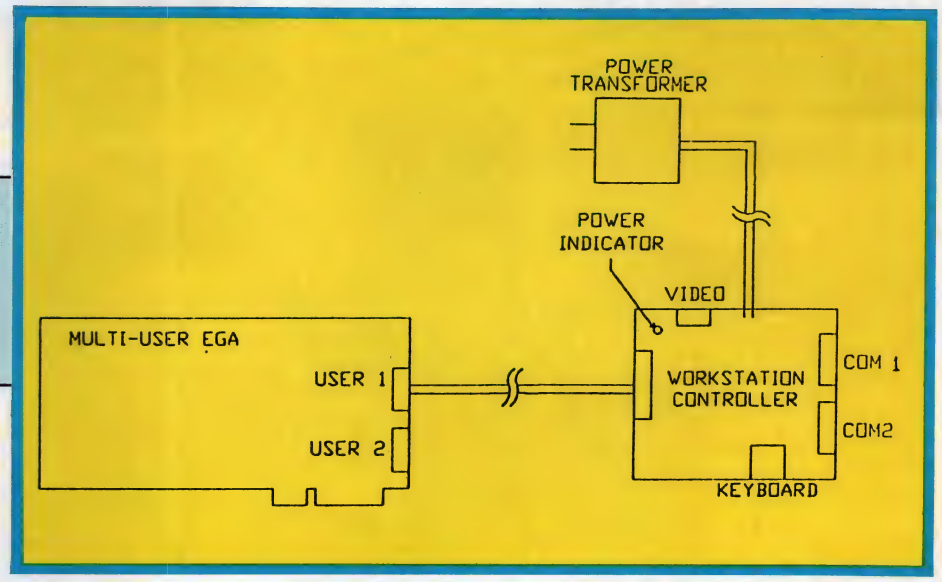

Illustration of how Viewport's components are connected for a multi-user system.

FlexOS 386
From Digital Research

FlexOS 386 is a minicomputer operating system for the desktop environment. It has a UNIX-like run-time library and is more powerful than OS/2. I like to think of it as the chameleon of operating systems. In addition to being a multi-user, multi-tasking operating system, it's chief attribute is its ability to perform real-time functions for transaction processing, external event control, data acquisition, and factory automation—while its DOS interface runs standard DOS business and graphics applications.

FlexOS grew out of the Concurrent DOS technology in 1983 when IBM contracted with DRI for a proprietary real-time operating system for their 4680 point-of-sale system. At the same time, Intel asked DRI to develop a protected-mode operating system for their forthcoming 80286 microprocessor. Development of both operating systems ran concurrently.

The IBM OS was successfully completed; the Intel project ran afoul. Based on the specifications DRI had received, they discovered several serious bugs in the microcode that would have to be corrected before they could finish the operating system. Intel submitted new specs. However, when samples of the chip were available, DRI found that Intel had made additional code changes without telling them, which in turn spawned other bugs that still haunt this processor today. After making a costly investment in software engineering, they pulled out of the project.

As they reexamined their position, they realized that the real-time attributes they had incorporated into the IBM project would blend well with the protected mode features of the 286 processor, and a major effort was initiated to develop a minicomputer operating system environment that could serve a broad base of applications. They called it FlexOS, which meant Flexible Operating System, and it made its debut in 1985.

In recent years, it has grown into a related family of operating systems. Versions are available for the NEC V60, the Motorola 68000 series, and the Intel 80186, 80286 and 80386 processors. The 186 version is ROMable for dedicated control operations. Some manufacturers of sophisticated control hardware have discovered that if they take the FlexOS real-time kernel and ROM it on a host controller, it will allow OS/2 to supervise real-time applications. Whether DRI will license FlexOS for this purpose has not been determined.

Although FlexOS requires applications be specifically written for its real-time functions, DRI has now added both PC/MSDOS 3.3 and DR DOS compatible, and GEM graphics interfaces to bring it into the mainstream computing standard. This now allows it to run a wide base of DOS applications. FlexOS runs on 80% of the point-of-sale terminals in Japan (most of which are manufactured by IBM and TEC), and is in wide use in the U.S. in chain store operations.

Major multi-national firms like Siemens, ICL, Honeywell, and others have taken FlexOS into a broad range of real-time applications. Their suggestions regarding real-time control of robotic assembly devices, capturing remote data, process control, point-of-sale terminals, event monitoring, controlling large-scale security systems, and even nuclear power plants, contributed to the rapid development of this operating system over the last three years.

Architecturally, FlexOS and CDOS have gone different ways. CDOS is a tightly integrated operating system which requires that most hardware drivers be incorporated into the kernel of the operating system. Thus, adding support for the SunRiver terminals meant a complete rewriting of the kernel. While this greatly improves the run-time performance of the OS, it is costly in terms of development time.

FlexOS, on the other hand, is totally modular, so that the integrator can use as much or as little of the operating system as he needs for his application. Many devices and drivers can be linked into the kernel and loaded on the system dynamically (or "on-the-fly"), even while it is in full operation. Six multi-tasking windows are supported on the host console. Five of these can run applications or monitor event control at remote locations. The sixth window is called the status window. It reports on the current state of all running applications and allows you effect special commands.

With the announced availability of MetaWare cross-assembler tools for FlexOS, UNIX, VMS, and Multibus II applications can be brought from minicomputers to the desktop. Under current consideration is a possible UNIX front end to FlexOS. It is also simple to build an OS/2 front end, and even simpler to perform minor patches to the source code of OS/2 application software so that it will run under FlexOS 386's multi-user capabilities.

With this kind of flexibility and power, FlexOS 386 has the potential to become one of the most powerful operating systems in the desktop market. It is functionally superior to most minicomputer operating systems, and is now being ported to VMS and Multibus II computers. It has extraordinary screen handling and disk I/O attributes that will leave OS/2 in a cloud of dust. Furthermore, the operating system uses a limited set of system calls to perform a large number of operations. OS/2 was designed only as a single-user, multi-tasking operating system that uses a grab-bag of system calls. As a result, it is massive, and requires operating system that uses a grab-bag of system calls. As a result, it is massive, and requires multi-megabytes just to load. It doesn't have a real-time event management kernel.

FlexOS 386 has been has been so sharply honed that it will run on a 640K 386 system. More importantly, since real-time applications require instantaneous response time in decision making operations, FlexOS performs I/O functions on a speed ratio power users can only experience on minicomputers.

As I was putting the final touches on this multi-user graphics report, DRI forwarded some additional information on the new X/GEM interface I mentioned briefly in the CDOS 386 MGE section. It features a modular architecture designed to take advantage of an operating system's multi-tasking, dispatching and graphics services while remaining portable to other multi-tasking platforms such as UNIX or X Windows.

The X/GEM application interface (API) is the same as its single-tasking predecessor. However, extensions are offered so that the added features of the underlying system can be used to improve performance. The new FlexOS console system provides the basic graphics support services used by X/GEM. Basic services such as virtual console and window management support and keyboard, mouse, and output primitives for pixel-oriented displays are inherent to the program interface. For example, the FlexOS write function supports character strings and drawing primitives, such as polyline, polymaker, arc, box, bar, pie, contour fill, etc., plus clip region definition, and graphic attribute definitions.

X/GEM adds an application manager and run-time library to the FlexOS application interface, and a set of drivers for graphics devices such as the VGA monitor and Postscript printer. The application manager is the ring leader of the X/GEM system. It runs as a FlexOS application (basically, it's an expanded window manager) and starts and terminates all applications, manages the system menu, provides key environmental information, routes interprocess communications, and protects applications from each other. In a multi-user environment, all physical consoles would have their own application manager.

The shared run-time contains the set of routines that gives X/GEM its programming environment. Within the library, the standard GEM functions are translated into FlexOS-specific calls for execution by the system. The library is loaded along with the first application (typically, but not necessarily, the application manager), and remains in memory until the last X/GEM application is terminated. Only one copy of the run-time is needed, regardless of the number of physical consoles, virtual consoles, and applications running. (This is an example of the "shared code" ability of the Concurrent DOS native mode operation.)

All functions in the library are called in the same way no matter what the underlying hardware is. For example, you use the same function and arguments to draw a box on a VGA monitor as you would on a CGA monitor or a Post Script printer. All hardware-specific translations are made in the drivers.

FlexOS and X/GEM provide the ideal vehicles for multi-user graphics installations. The basic system performs the fundamental real-time, multi-tasking and security services necessary for optimized CPU dispatching between user tasks and protection against unauthorized data access. The modular architecture and dynamically loadable drivers (it is expected that these mechanisms will become available in the Concurrent DOS operating systems in 1989) allow consoles to be added and deleted

continued on page 83

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BUS 88

640K 10 MHz
12 MHz Optional

STANDARD FEATURES

1. 100% IBM XT-Compatible
2. Fully Compatible PHOENIX BIOS Installed
3. INTEL 16-Bit 8088-1 CPU, Running at 4.77/10 MHz, Keyboard Selectable
4. 640K RAM on Board with a SI Rating of 2.1
5. HERCULES Graphics Emulation Card w/Printer Port, Graphics 720H x 384V/Alphanumeric 80-25
6. 14" Non-Glaring/Dual Frequency, Swivel, Flat Screen, High Res. Amber Monitor w/1000 LINES
7. CLICKING Keyboard w/LEDS for NUM, CAPS, SCROLL Locks, Enlarged RETURN, SHIFT, Keys
8. 2 DS/DD 360K 5¼" Half-Height Direct Drives, Optional 3½" 720K or 1.44 MB Floppy Disk
9. Runs ALL MS-DOS Programs, LOTUS 1-2-3, FLT. SIMULATOR, DBASE III PLUS, AUTOCAD, SYMPHONY, PAGE MAKER, VENTURA,
10. Operates MS-DOS, PC-DOS, GW BASIC,
11. EIGHT Fully IBM-Compatible Expansion Slots
12. Switchable 150 Watts 110/220 V Power Supply w/Four Cables and Over Voltage, Over Current, Short Circuit Protections, UL, CSA & FCC
13. Multi I/O Card: Controls Two FD with PRINTER GAME, SERIAL Ports and Battery-Backed Real-Time Clock and Calendar, and Upgradable to SECOND Serial Port
14. 8087 Math Coprocessor Socket Installed
15. Nickel Plated, Enamel Coated, Metal Case with 4 Drive Slots and Speaker for Audio Use
16. Six Slots Available after Sys. Configuration
17. Power-On Self-Testing of Systems Components
18. Ready for 20-30 MB HARD DISK Installations
19. Operating Manuals for Monitor, Keyboard, MB, MGP Card, Multi-I/O Card, Operator's Manual
20. Optional EGA, VGA, and Color Systems
21. Optional 12 MHz Systems:
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    -Running at 4.77/12 MHz "0" Wait
    -Performance Rating: SI = 5.0
22. 30-DAY MONEY-BACK GUARANTY W/ONE YEAR WARRANTED LABOR AND PARTS
23. Fully Setup and Diagnostically Tested with 72 Hours Burned-In, IMMEDIATE Delivery

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Printer Card	1200/2400 External
Game Card	4800 Internal
Everex Magic I/O	9600 Internal
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KEYBOARDS	14" Amber Swivel
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ALPS' Clicking 102	14" VGA Swivel
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30MB/Seagate ST-238	Monitor Stand
43MB/Seagate ST-251	CPU Stand
43MB/Seagate ST-251-1	Printer Cable
71MB/Miniscribe 6085	Extension Cable
80MB/Seagate ST-4096	Microsoft Mouse
103MB/Priam ID100RC	Genius Mouse
120MB/Maxtor 1140	Logitech Mouse
337MB/Priam ID330	Joy Stick
FLOPPY DISKS	Dust Cover
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NX-1000	SP 1200AI,SK3005AI
NX-1000C	SL 80AI
NX1000 COLOR	**BROTHER**
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321 SL P351	M1409,HR20
341 SL	M1509,HR40
EPSON	M1709,HR60
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MSP-15	292

EGA/VGA SYSTEMS

BUS 286

FOUR MB MOTHERBOARD
12 MHz "0" Wait
16 MHz Optional

STANDARD FEATURES

1. 100% IBM-AT Compatible, Accepting ALL IBM Parts
2. Ready for OS/2 Systems Operations
3. Fully Compatible PHOENIX or AMI BIOS Installed
4. 16-Bit INTEL 80286-12 CPU, Running at 6, and 12 MHz "0" WAIT, Switchable by Jumper or Keyboard
5. Using KEL's "LED CHIP CARRIER" or "LCC" For CPU's Socket, Excellent for Releasing Heat and Passing Shocking Test, Especially in The Application of AUTOCAD's Continuing Usage of the Systems
6. Using VERY LARGE SCALE INTERGRATION (VLSI) Technology
7. 640 K on Board, Expandable to ONE MB
8. Memory Expandable to 16 MB w/Add-On Memory Card
9. 14" Non-Glaring, Dual Frequency, 50/60 Hz, Swivel, Flat Screen, High Res. Amber Monitor w/1000 LINES at Center
10. HERCULES Graphics Emulation Card w/Printer Port:
    -Graphics Res. 720H x 348V/Alphanumeric Character 80 x 25
11. Runs ALL MS-DOS Programs, Including LOTUS 1-2-3, FLIGHT SIMULATOR, DBASE III PLUS, AUTOCAD, WORDSTAR, SYMPHONY, PAGE MAKER, VENTURA, WORDPERFECT, Etc.
12. Operates MS-DOS, PC-DOS, GW BASIC, NOVELL, UNIX, XENIX
13. 64Kb Read-Only Memory (ROM) Expandable to 128Kb
14. 7-Channel Direct Memory Access (DMA)
15. Three Programmable Timers w/16-Level Interrupt
16. Battery-Backed COMPLEMENTARY METAL OXIDE SEMICONDU (CMOS) Memory RAM to Maintain Systems Configurations
17. Battery-Backed Real-Time Clock and Calendar
18. Eight Expansion Slots Accepting ALL XT/AT Add-On Card:
    -2 8-Bit (XT) w/62-Pin Card-Edged Socket
    -6 16-Bit (AT) w/36 and 62-Pin Card-Edged Socket
19. Switchable 220 Watts 110/220 V 47-400 Hz Power Supply w/Four Cables and Over Voltage, Over Current, and Short Circuit Protections, Meets UL, CSA & FCC
20. CLICKING 102 Keys Keyboard w/LEDs for CAPS, NUM, SCROLL, POWER-ON Locks, Enlarged RETURN, SHIFT, TAB, CAPS Keys
21. INTEL 80287 Math Coprocessor Socket Installed
22. One Combined Hard Disk/Floppy Disk Controller Card, Controls Two Hard Disks and Two Floppy Disks
23. One 1.2 MB Half-Height 5¼" Height-Density Floppy Disk
24. One 1.44 MB Half-Height 3½" Floppy Disk
25. One RS-232 Serial Card, Upgradable 2nd Serial Port
26. Power-On Self Testing of Systems Components
27. Nickel Plated, Insulated Enamel Coating, Heavy Duty, Lockable Case as Keyboard Lockout w/Speaker Installed:
    -LED Indicator Lights for Turbo Speed/Hard Disk/Power
    -Hardware Reset and Turbo Buttons Installed
    -Five Drive Slots Available
    -1.5MM in Thickness w/Dimension of 54 x 43.2 x 16 CM
28. 5 Expansion Slots Available, After System Configurations
29. Operating Manuals for Monitor, Keyboard, Motherboard, MGP Card, RS-232 Card, and Operator's Manual
30. Ready for 20-43-72-84-103-120-140-230-337 MB Hard Disk, 20-40-60-150 MB Tape Backup, Network, Multi-User, File Server, Multi-Tasking, Mouse, Joystick Installations
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BUS 286 w/43 MB, SEAGATE ST-251, 39 MS
BUS 286 w/43 MB, SEAGATE ST-251-1, 28 MS
BUS 286 w/80 MB, SEAGATE ST-4096, 28 MS

OPTIONAL FEATURES

1. FOUR MB MOTHERBOARD
   -Up to 4 MB RAM on Board, Using 34-Pin Ram Socket Suitable for Both 41256 or 511000 (ONE MB) DRAMs
   -INTEL 80286-12 CPU, Running at 6,10,12 MHz, "1" Wait Switchable by Jumper or Software
   -PHOENIX BIOS
   -VLSI, LCC as in One MB Motherboard
   -On Board Memory Selections:
   -512K, Using 18 Pcs 41256
   -512K/512K, Using 36 Pcs 41256
   -640K not Available
   -640K/384K, Using 36 Pcs 41256
   -2MB, Using 18 Pcs 511000
   -4MB, Using 36 Pcs 511000
2. 16 MHz "0" Wait, up to FOUR MB on Board
   -INTEL 80286-16 CPU, PHOENIX BIOS
   -Using 256-8 DRAMs or ONE MB DRAMs
3. 1:1 INTERLEAVE HARD DISK/FLOPPY DISK CONTROLLER
4. ESSI (Enhanced Small System Interface) Controller Card
5. SEAGATE, MINISCRIBE, NEC, MAXTOR, MICROPOLIS, HD
6. VGA, EGA, or Color Systems with Autoswitch VGA or EGA Card
7. HERCULES's GRAPHICS PLUS Card and IN-COLOR Card
8. INTEL's ABOVE BOARDS, ATI's VGA, EGA WONDER Card
9. QUADRAM'S QUAD EGA Plus, GENOA's SUPER EGA
10. PARADISE's AUTOSWITCH 480 KGA, AST's RAMPAGE
11. NEC 13" MULTISYNC II(800 x 560), 15" MULTISYNC PLUS
12. TALLGRASS, SYSGEN 20/40/60 MB Tape Backup Systems
13. HAYES or HAYES Compatible 1200/2400/4800/9600 Modem
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15. INTEL or WEITEK 1167 Math Coprocessor
16. MICROSOFT MS-DOS 3.3 and GW BASIC

Network/Multi-User

BUS 386

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One MEGAbyte 80NS Static Column RAM
20 MHz "0" WAIT Optional

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1. 100% COMPAQ Compatible with Fully COMPAQ Compatible Memory BUS, Ready for OS/2 Systems
2. PHOENIX 386 BIOS with Setup and Diagnostic Programs in ROM
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6. HERCULES Graphics Emulation Card with Printer Port:
   -Graphics Resol ution 720 H x 348 V and Alphanumeric Character 80 x 25
7. INTEL 32-Bit Double Sigma 80386-16 Microprocessor, Operating at 16 MHz "0" Wait, Software Selectable of Four Speeds: 4.77/6/8/16
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9. 80287/80387 Math Co-Processor Socket Installed, Using INTEL or WEITEK
   -80387 is 32-Bit Bootable to DOS/SCO Xenix System V/OS/2/PC MOS 386
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    -TWO 8-Bit (XT) with a 62-Pin Card-Edged Socket
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11. Operates OS/2, MS-DOS, PC-DOS, UNIX V, XENIX and WINDOW/386
12. Runs All MS DOS Software Including LOTUS 1-2-3, WORDSTAR, AUTOCAD, FLIGHT SIMULATOR, DBASE III PLUS, RBASE, FRAMEWORK, WORDPERFECT, SYMPHONY, PAGE MAKER, VENTURA, Etc.
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23. Switchable 220 Watts 110/220 V 47-400 Hz Power Supply with Four Cables and Over Voltage, Over Current, and Short Circuit Protections, Meets UL, CSA & FCC
24. One TEAC 1.2 MB 5¼" Half Height High Density Floppy Disk (FD-55GFR)
25. One TEAC 1.44 MB 3½" Half Height Floppy Disk (FD-235HF)
26. One RS-232 Serial Card with Upgradable 2nd Serial Port
27. Nickel Plated, Insulated Enamel Coating, Heavy Duty, Lockable TOWER CASE
    -Speaker Installed for Audio Use
    -LCD Display for CPU Speed with Hardware Reset and Turbo Buttons
    -LED Indicator Lights for Turbo Speed/Hard Disk/Power Installed
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28. Five Expansion Slots Still Left Open After Systems Configurations
29. Operating Manuals for Monitor, Keyboard, Motherboard, MGP and RS-232 Card
30. Ready for 20-43-72-84-103-120-140-230-337 MB Hard Disk Installations
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32. Ready for Network/Multi-User/Multi-Tasking/File Server/Mouse/Joy Stick Interface
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BUS 386 w/71 MB, MINISCRIBE 6085, 28 MS
BUS 386 w/80 MB, SEAGATE 4096, 28 MS
BUS 386 w/244 MB, MAXTOR 3280, 28 MS
BUS 386 w/337 MB, PRIAM ID330, 20 MS

OPTIONAL FEATURES

1. 20 MHz Systems with INTEL 80386-20 CPU, MIPS = 2.53, SI = 23.0, LANDMARK = 25.5
2. CACHE MEMORY
   -Using a Unique 4-Way Associative CACHE System, Resulting in Higher True "Hit Rate"
   -Using on Our 20 MHz Systems, It is 44% Faster Than a Standard Intel 16 MHz
   -CACHE Size is 32kb (35-Nanosecond SRAMs)
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3. 1:1 INTERLEAVE HARD DISK/FLOPPY DISK CONTROLLER CARD
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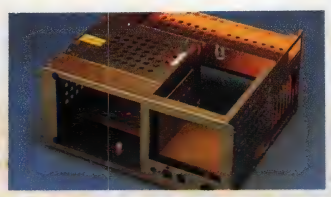
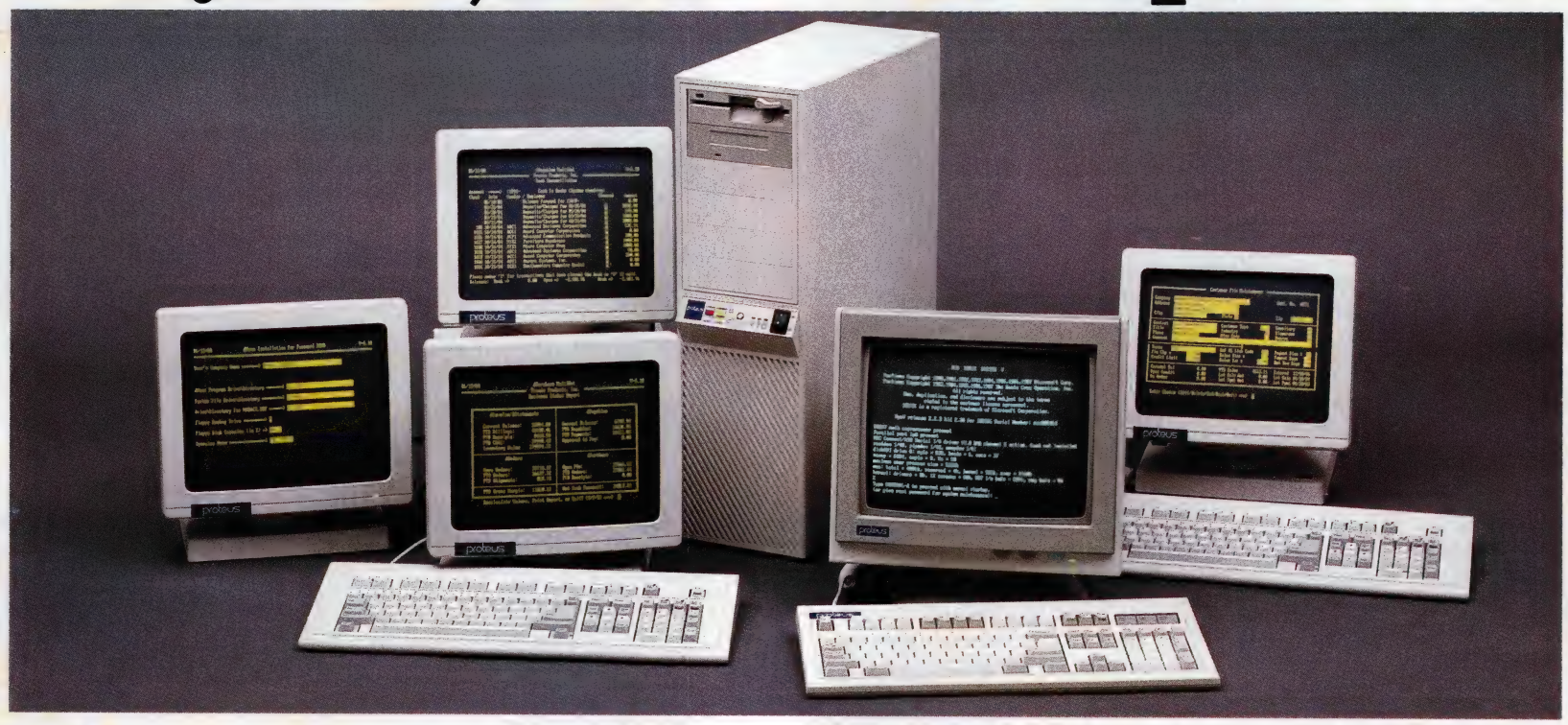


Reinforced Aluminum Frame

7 Expansion Slots Available

If you're considering a multi-user system, listen to the experts.



Before you buy a multi-user system, you may want the advice of experts. That's why we've included highlights of a recent evaluation of the Proteus® System 3400M.

"The Proteus System 3400M is a system that I would consider owning from many standpoints. It is reliable, has high performance capabilities, is well built, has an open architecture, and is guaranteed to work."

Stan Veit, Editor, COMPUTER SHOPPER MAGAZINE

Here's why the experts are so impressed.

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The System 3400M comes with a high-speed 80MB hard disk that provides optional access time as low as half a millisecond.

The System 3400M incorporates an 80386 Intel CPU running at up to 25MHz with unique memory techniques.

And you can configure the 3400M to your particular office automation needs.

Competitively Priced.

The System 3400M maintains Proteus's reputation for providing top-quality computers at quite reasonable prices.

"The Proteus System 3400M is a business computer and more....This is a complete multi-user solution that arrives with all peripherals and operating systems installed and tested for system compatibility. Proteus not only guarantees its compatibility with MSDOS but also with Unix, SCO Xenix, Novell, 3-Com, Pick, and Theos."

Douglas E. Kilarski, COMPUTER SHOPPER MAGAZINE

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These are just some of the publications that have lauded praise on the Proteus line of computers. In fact, Proteus computers are among the finest and fastest available today. They have become fixtures in such organizations as NASA, General Motors, Citicorp, and more.

If you're a VAR or reseller grounded by the performance quality, speed, and support requirements of most multi-user systems, take a look at the one that flies. Call today to find out more about the multi-user system that the experts loved: The Proteus System 3400M.

PROTEUS STANDARD 8-USER SYSTEM 3400M

- 80386-20 Intel Processor Running at 20MHz
- 2MB 32-bit RAM
- Dual Hard Disk & Floppy Controller
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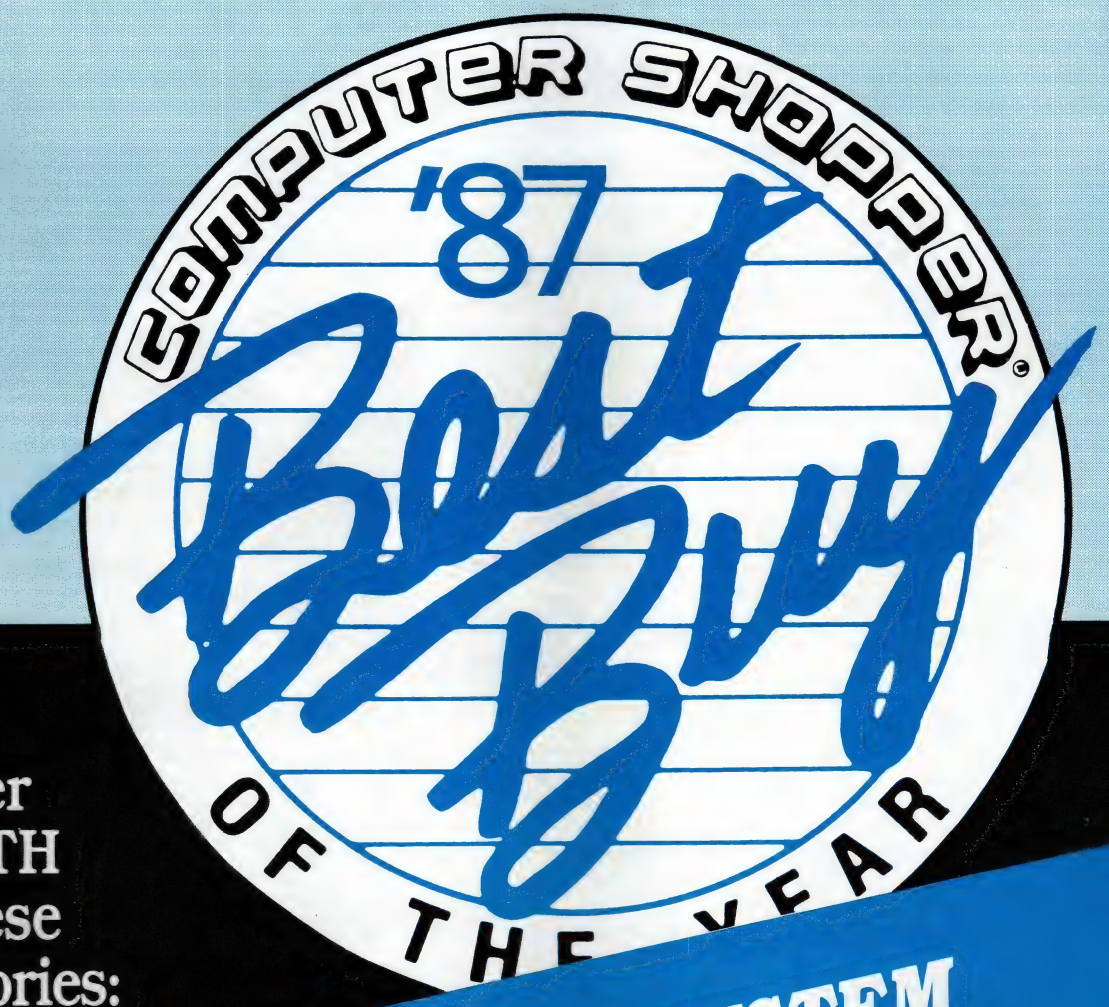

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Here's what *PC Week* Said About Northgate's 80386/16 System...

Northgate 80386 System Towers over Competitors In Price and Performance

Northgate's 386 Tower is an extremely good deal that warrants careful attention. For $3,658.50 Northgate sells a complete 80386-based system that includes a hard drive, a monochrome monitor and assorted system software. So far the 386 Tower may not sound special, but a closer look at this computer's specifications reveal a speed freak's delight.

The Omni-Key 102 keyboard included with the system has good action and feel. This keyboard follows the newest IBM enhanced keyboard design, except the function keys are where they belong: in two vertical columns to the left of the rest of the keys.

The system comes with two hard-shell manuals for GW BASIC and MS-DOS 3.3. Northgate also includes its own Insta-Cache program for disk caching and Golden Bow's VOPT optimizing software, which reorganizes hard drives for optimal performance.

Northgate guarantees components for one year, and will pay for shipping replacement parts by overnight express. A 30-day compatibility warranty states that the company will refund system costs if a standard DOS program cannot be made to run on the Tower.

With its 16MHz 386 Tower, Northgate has upped the speed-freak ante with a fast, complete system. ■

FIRST LOOKS

Northgate Power 386: Premium Performance at a Bargain Price

HANDS ON

BY BILL O'BRIEN

Field-leading 386 performance just got cheaper. Northgate Computer Systems' Power 386 rivals the power of the Compaq Deskpro 386/20 at a fraction of the cost.

The Power 386 is an upright, 20-MHz floor model with a base price of $4,295—including a high-performance 65MB hard disk.

A 64K static RAM memory cache deserves much of the credit for the Power 386's performance. Like the Deskpro 386/20, the Power 386 maintains a high-speed, 32-bit path to memory, separate from the I/O bus.

Whereas the 386/20 makes use of Intel's sophisticated cache controller chip, however, the Power 386 falls back on a direct-map static RAM system composed of discrete logic components. Compaq's solution no doubt earns it memory access performance gains in some cases, but the Power 386 won't be far behind.

Northgate's Power 386 sports power and reset switches at the top, along with a disk activity light. Inside are eight slots.

The hard disk drive does not have an overly spectacular track-to-track access time—28 milliseconds—but that is a mechanical measurement of disk capability. Data throughput, the speed at which the information is actually passed across the bus and the more important measure of performance, rates as spectacular when hard disk caching is enabled. But even without caching, the large- and small-record times for the PC Labs benchmark tests rank the Power 386 machine right up there with the Compaq Deskpro 386/20.

The standard configuration includes a 14-inch monochrome monitor, one 5¼-inch 1.2MB floppy disk drive, and one 3½-inch 1.44MB floppy drive. That leaves you with one empty half-height bay.

Whether you purchase this 386-based machine for its price tag or for its performance, the chances are that you won't be disappointed. Watch *Microsoft Windows* load quickly for a change, or observe a pull-down menu snap up like a runaway window shade, and you will finally get an honest feel of what speed is all about. ■

FACT FILE

Northgate Power 386
Northgate Computer Systems
13895 Industrial Park Blvd., #110
Plymouth, MN 55441
(612) 553-0111
List Price: With 1MB DRAM, 64K SRAM cache, one 5¼-inch 1.2MB floppy disk drive, one 3½-inch 1.44MB floppy disk drive, 65MB hard disk, monochrome monitor, $4,295.
In Short: The Power 386 delivers top performance and intelligent design at an excellent price.

CIRCLE **447** ON READER SERVICE CARD

Here's what *Byte* Said About the Hard Drive Performance of Northgate's Systems...

THIS DRIVE/CONTROLLER IS THE MUSCLE OF NORTHGATE/80286 AND 80386 SYSTEMS

Table 1: *The benchmark results show that the Northgate Turbo kit tops the list, followed by the SCSI and ESDI drives. The three hard disk drive cards were the slowest performers. (All times are in seconds, except where noted.)*

Hard disk drive	Hard seek (average)	DOS seek and read		File I/O			1-megabyte file		Coretest (ms)	
		1 sector	8 sectors	Total seek	Read 1K byte	Write 1K byte	Write	Read	Average seek	Average trk/trk seek
Northgate Turbo kit	16.6325	12.72	26.42	0.33	0.02	0.019	4.74	3.77	36.47	15.63
Columbia SCSI drive	N/A	N/A	N/A	0.28	0.015	0.018	5.9	4.32	19	6
Core AT40F	4.545	8.35	12.8	0.35	0.014	0.014	4.25	4.48	10.43	2.27
Tandy SCSI drive	N/A	N/A	N/A	0.18	0.016	0.019	5.6	4.65	28	6
Core AT43	7.485	10.61	20.09	0.24	0.017	0.016	5.64	5.55	20.08	4.08
Priam ID45-AT-D2	6.64	9.7	25.75	0.09	0.018	0.016	7.41	6.81	19.88	3.89
Toshiba MK-54FB	7.03	9.96	24.21	0.58	0.015	0.03	16.5	7.74	25.7	4.6
Fujitsu M2242AS2	9.8875	10.66	24.11	0.44	0.016	0.029	16.51	7.76	37.8	5.1
Rodime RO 3055	7.4575	10.67	26.97	0.35	0.016	0.018	8.26	7.78	21.86	6
Seagate ST251-1	7.8425	10.31	26.89	0.59	0.017	0.03	16.74	7.84	N/A	N/A
Control Data Wren II	7.0175	10.65	26.97	0.48	0.016	0.029	16.7	7.87	23.6	4.1
Micropolis 1333A	7.4575	10.54	26.95	0.45	0.016	0.03	16.73	7.87	27.83	5
MiniScribe 3053	7.1775	10.56	26.89	0.4	0.016	0.03	16.83	7.87	29.5	5.4
CMS F40-K	7.4375	10.59	26.86	0.24	0.016	0.029	16.66	7.88	29.2	4.7
Microscience HH-1050	8.2625	10.58	26.78	0.44	0.016	0.03	16.62	7.89	26.5	4
Plus Hardcard 40	10.24	12.39	52	0.14	0.025	0.031	17.21	13.77	39.5	6.88
CompuAdd FlashCard 49	6.9725	10.2	81.34	0.29	0.047	0.045	36.45	36.29	27	7.61
SPC Scorecard 44	8.3125	10.8	81.22	0.31	0.045	0.043	36.58	37.89	24.07	4.77

NOW...IF NORTHGATE'S GOT THE COMPUTER WORLD TALKING

Experts... They're talking about Northgate's Industry Leading 286 and 386 Systems and the Exclusive OmniKey/102 Keyboard

COMPUTER SHOPPER

Here's what *Computer Shopper* Said About Northgate's 80286 System...

Computer Shopper's Best Buy Awards—1987

As a consumer, you are interested in getting the most for your dollar while at the same time purchasing the finest piece of equipment available within your budget. This review is about a particularly good bargain if you're in the market for an 80286 based 12MHz AT clone. So good, in fact, that this computer received the 1987 *Computer Shopper* Best Buy Award. I'm referring to the Northgate 286 from Northgate Computer Systems of Plymouth, Minnesota.

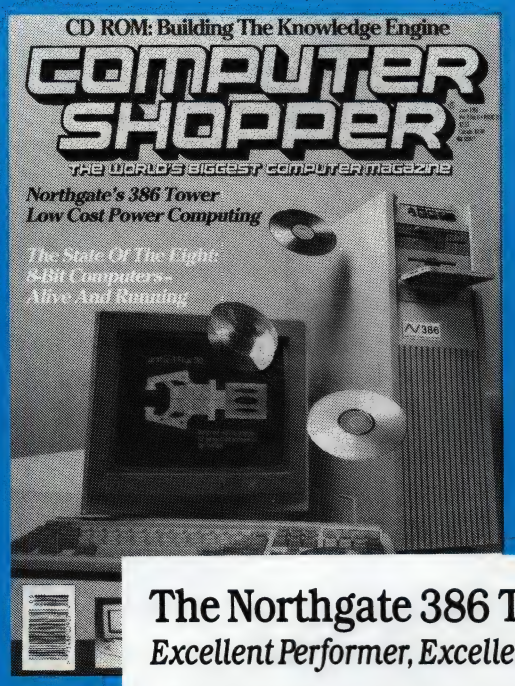
Using the RLL technology, over 50% more data can be stored on the disk than with the standard hard-disk controller card. With the high speed Miniscribe fixed disk installed, the Northgate 286 offers a whopping 64.2 megabytes of on-line storage. The RLL controller is also much faster than the standard AT controller; with a one-to-one interleave, transfer rates three to five times that of the standard AT are achieved. The disk and controller really make a winning combination.

Conclusion

The Northgate 286 system, as bundled from Northgate Computer Systems, is a totally complete package lacking only a printer. It comes with a case, power supply, keyboard, 1 megabyte of high speed RAM, a serial port, a parallel port, two floppy drives (one high density and one standard DSDD), a high speed fixed disk drive running on a snappy RLL controller, a Hercules compatible monochrome graphics adapter and a monochrome video monitor.

All of the individual components of the Northgate 286 appear to be name brand items. For instance, the RLL controller is manufactured by Omti, the hard disk by Miniscribe and the floppy drives by Fujitsu.

Running the bus at a 12MHz clock rate doubled with the speed of the RLL controller make the Northgate 286 an extremely high performance system.


CD ROM: Building The Knowledge Engine
COMPUTER SHOPPER
THE WORLD'S BIGGEST COMPUTER MAGAZINE
Northgate's 386 Tower
Low Cost Power Computing
The State Of The Eight-Bit Computer— Alive And Running

The Northgate 386 Tower

Excellent Performer, Excellent Price

This review is about such a product—the Northgate 386 Tower. At a cost of more than $3,000, it's definitely not being marketed to the average home user. On the other hand, its advanced features and exceptionally high performance makes this machine an excellent choice for a business that demands high speed computational power for applications such as file servers, CAD workstations and software development.

The Warranty

I usually make mention of the manufacturers warranty at the end of my review. This time, however, I feel it is worth mentioning up front.

Northgate provides a one year parts and labor warranty on their 386 Tower. In addition, Northgate offers an overnight parts replacement guarantee that reads, "In the event of failure of a part that disables the system, Northgate will ship, the same day if notified by 12 noon Central Time, a new replacement part." That has got to make it one of the best warranties in the business!

While Northgate's Omni-Key keyboard has a somewhat light touch when compared to the original IBM PC, there is probably no clone keyboard that I know of on the market today that has a better tactile feel than the Northgate; it features the familiar click sound, click sensation and tactile feel of IBM's own keyboards.

Once again, I would like to say that the Northgate Omni-Key 102 keyboard is probably the most comfortable keyboard for those of you that have grown accustomed to the original IBM AT style keyboard while still wanting to upgrade to the new 102 style keyboards. They feature good tactile response, they're laid out well, are attractive and very pleasant to use.

Conclusion

The Northgate 386 Tower is an impressive system. Operating approximately eighteen times faster than the original PC, the system would be an ideal choice for those requiring hard core processing power; especially in applications such as CAD systems, file servers and demanding software development work.

Despite the fact that it is marketed solely via mail order, the system arrives ready to plug in and go. The fixed disk arrives pre-formatted complete with the MSDOS 3.3 operating system. The disk drives are installed and the system is properly configured right down to the AUTOEXEC.BAT startup program. Add to that one of the best warranties in the industry and you have a system that even the most leery mail orderer can appreciate and order with confidence.

It has an exceptionally nice keyboard and is compatible with 360K 5¼" floppies, 1.2 meg 5¼" floppies, 720K 3½" floppies and 1.44 meg 3½" floppies.

Since it features the Intel 80386 processor, it is not apt to become obsolete for at least three or four years. Furthermore, it is compatible with the new OS/2 operating system.

INFO WORLD

"The Dream Machine."

PC MAGAZINE

PC Magazine Advised Readers About OmniKey/102 when asked for a recommendation...

COMPAQ KEYBOARD

I recently bought a Compaq Deskpro/286 and I am very happy with the machine except for the mushy keyboard. Does any manufacturer produce an adapter that allows the IBM Enhanced keyboard to work on a Deskpro?

Dave House
Linden, New Jersey

Many IBM keyboard lovers have settled on Northgate Computer Systems' keyboard, having the closest thing to a true IBM feel. At $99, the C/T 101 provides an IBM-like, clicky feel.

AND...*Computer Shopper* Featured Northgate's 80386 Power System on its June Cover. Here's What it said...

PC WEEK

Here's what *PC Week* Said About The Northgate OmniKey/102 Keyboard

RELEASE NOTES

By Garry Ray

Three guesses: What's the most important characteristic of a PC?

Some would assert that it's the quality and resolution of the display, others the capacity and performance of the system's disk drives. Still others, the speed freaks, would note that supercharged processors running at a minimum of 12MHz (20MHz on an 80386 system) constitute the definitive measure.

This editor, logging at least 30 hours per week in front of a PC (that's nearly 1,500 hours per year or 62 days non-stop) takes exception to all of the above.

From the quotidian point of view, the most important characteristic of any PC system is neither speed nor resolution, nor access times, nor anything else that manufacturers generally tout above all else. It's the lowly, ill-treated and often-abused computer keyboard that defines a system. This may seem an obvious fact to most users, yet manufacturers often seem to miss the point.

IBM, for example, replaced the perfectly functional, highly efficient PC/XT/AT keyboard (the original model with 10 function keys vertically mounted on the left-most section of the keyboard) with the horribly designed, "advanced" model that now appears on all of its system offerings.

This new keyboard is intrinsically more difficult to use than the original model, and that it is not directly supported by most existing PC software seems to bother IBM not a whit.

The keyboard design, with its horrible horizontal function keys, has been deemed the "standard" keyboard for all future IBM offerings (including terminals), and is the probable standard design for the Common-User Access provision of System Applications Architecture (SAA).

Compatibles manufacturers generally provide either Asian-manufactured keyboards that are so unresponsive as to make the whole system a disaster, or so flaky that a new replacement keyboard is called for.

The problem is, of course, that most of the available replacement keyboards are some derivation of the Keytonics keyboard line, duplicating that line's detestable "typing on a loaf of Wonder Bread" responsiveness. Until recently, there was no suitable alternative.

Now, upstart company Northgate Computer, of Plymouth, Minn., has released an inexpensive replacement keyboard that covers all of the bases. The company has been selling two excellent keyboards, its C/T 84 and C/T 101, for some months now. Both models represent the only alternatives to a true blue IBM model. But it was only this month that Northgate began shipping its revolutionary and much-needed OmniKey/102.

Better than any replacement keyboard ever used by this editor, it is also a viable alternative to IBM's own model. Duplicating the responsiveness and tactile feedback of the original IBM keyboard (the new IBM models seem to have suffered in the redesign), the OmniKey and its predecessors are likely the most comfortable replacements being sold today. But the OmniKey, supporting all 101 keys of the new IBM design, also has a unique, backward-looking design that places the 12 function keys where God intended them to be: horizontally, along the left side of the keyboard. To top it off, the introductory price is only $89.00.

Other intelligent features make the OmniKey an outstanding buy, but the major facts are these: It's durable, well-designed, sensible and has just the right feel. Best of all, it's relatively inexpensive. ■

ISN'T IT TIME YOU STARTED TALKING TO NORTHGATE, TOO?

More!

Compare performance...compare cost...compare features...compare quality.
Nowhere in the world will you find a 386 system to compare with...

"386 Northgate Power™"

ALL THESE FEATURES AND MORE ARE STANDARD

64 KB ZERO WAIT STATIC RAM CACHING • 1.2 AND 1.44 FLOPPY DRIVES • VERTICAL CASE
• 65 MB *FAST* HARD DRIVE • RLL ENCODING • 1:1 INTERLEAVING
• 1000 LINE 14" MONITOR • HARD AND FLOPPY DISK CACHING • AUTO OPTIMIZE
• LANDMARK 1.09 RATING: 23.2 • NORTON V4 SI: 18.7

$3658.50 complete system

MORE PERFORMANCE, MORE FEATURES IN A COMPLETE SYSTEM, NOTHING MORE TO BUY!
Yes, "386 Northgate Power" includes every feature you see here. No phony "bare bones" pricing. No hidden costs. Extras galore you won't get from other vendors. And a price hundreds lower than you'll pay elsewhere for the same features—if they're even offered!

TWO FLOPPY DRIVES—a 5¼" 1.2MB AND a 1.44 MB 3½" for total disk compatability with IBM and portables. HARD AND FLOPPY DRIVE CACHING for instant data read and write: a 65MB HARD DRIVE INCLUDED IN OUR LOW PRICE! Plus many more quality advantages!

We cut no corners to bring this Spectacular System to you. Every part is World Class. Each System Skillfully Engineered and Custom Constructed in our own Plymouth, MN facilities.

SYSTEM IS FULLY CONFIGURED, HARD DRIVES ARE FORMATTED, SOFTWARE LOADED, READY TO USE... "386 Northgate Power" is the Ideal System for High Speed CAD/CAM Workstations; Desktop Publishing; Ultra High Speed LAN File Servers; Intermediate Size (1-16 terminals) time sharing systems using XENIX/UNIX.

The Complete System arrives at your office fully configured, ready to plug-in and run. Hard drives are formatted, and partitioned. PLUS, you get "Insta-Cache" disk caching AND VOPT, Golden Bow's great disk optimizing *program all included in the amazing low price!*

Study the features and see why "386 Northgate Power" is the best value in state-of-the-art power computing, then...PHONE NORTHGATE TO PLACE YOUR ORDER. (Delivery times are subject to order demand levels.)

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

386 Northgate Power System Price Complete $3658.50

OPTIONS—ADD:	
20MHz INTEL DOUBLE SIGMA 80386 PROCESSOR	$949
3MB ADDITIONAL RAM INCL. EMS CARD	CALL
(SUBJECT TO CURRENT MARKET CHIP PRICING)	
HARD DRIVES ESDI AND SCSI TO 389MB (Un-Formatted)	CALL
EGA MONITOR W/640 X 480 AUTOSELECT CARD	$495
MULTISYNCHRONOUS MONITOR W/640 X 480 AUTOSELECT CARD	$695
MULTISYNCHRONOUS MONITOR W/800 X 600 AUTOSELECT CARD	$795
65 MEGABYTE HARD DRIVE FOR FAST BACKUP (INTERNAL)	$349
40 MEGABYTE STREAMING TAPE BACKUP (INTERNAL)	$495
60 MEGABYTE STREAMING TAPE BACKUP (INTERNAL)	$695
60 MEGABYTE STREAMING TAPE BACKUP (EXTERNAL)	$895
ON-SITE THIRD PARTY MAINTENANCE	CALL
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TAKE THE NORTHGATE THRUPUT TEST.
Find out if your "zippy-fast" hard drive system is REALLY in the fast lane. Send us $5.00 cash, check or money order and we'll send you the THRUPUT test program. In seconds you'll know how your system compares to Northgate systems. And when you buy a Northgate system, we'll refund the $5.00!

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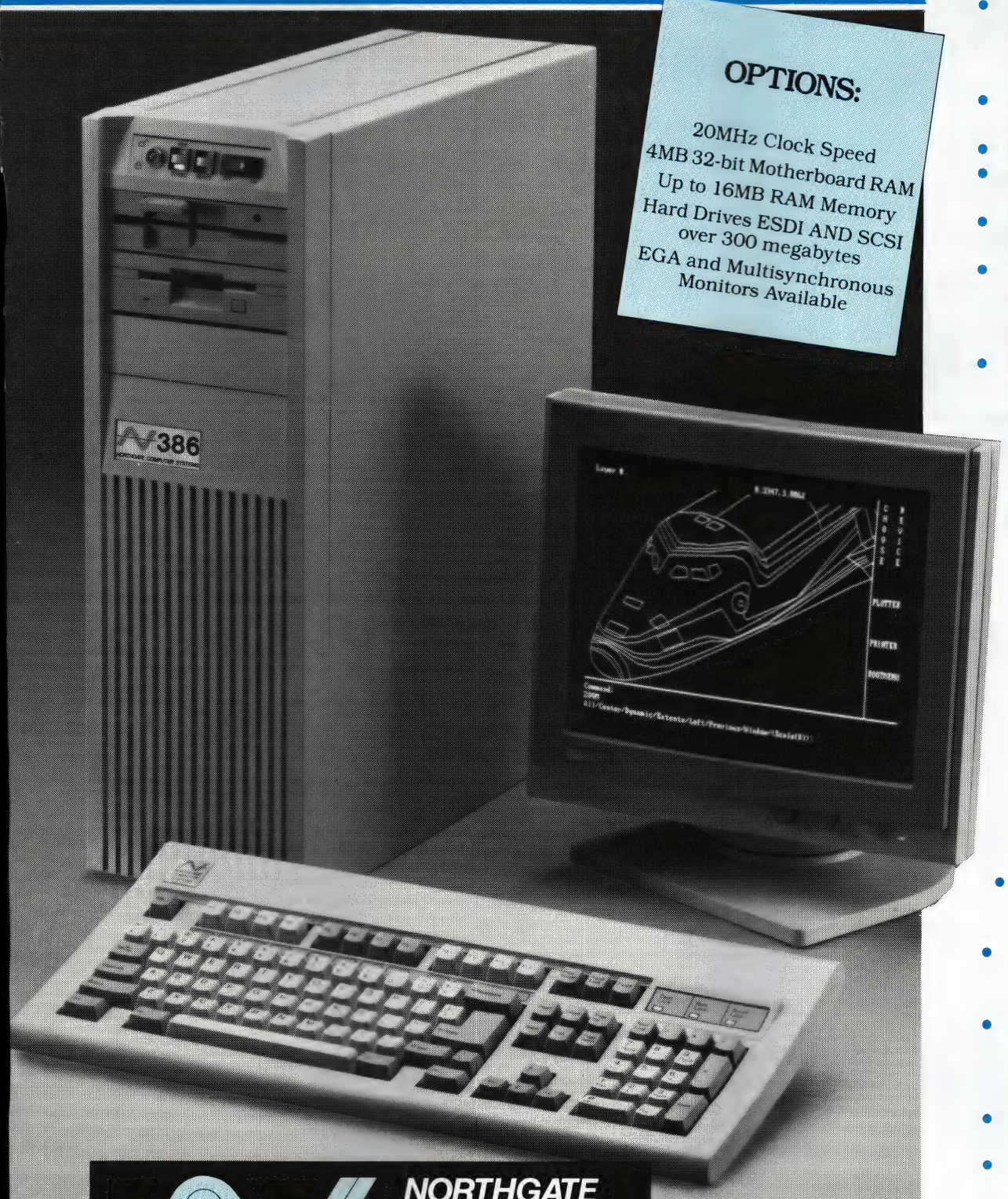
Compare "386 Northgate Power" Feature-For-Feature, Dollar-For-Dollar With Any Other 386 On The Market:



All These Features are Standard on "386 Northgate Power":

- 64KB OF 0 WAIT STATIC RAM CACHING IMPLEMENTED WITH 35/40 NANOSECOND STATIC RAM (Fastest Benchmark Tests of any 16MHz System)
- 8/16 MHz Cache/No-Cache, Keyboard Selectable
- BIOS with Setup and Diagnostics in ROM
- GENUINE DOUBLE SIGMA INTEL 386 PROCESSOR (Beware! Others may supply 16 MHz single Sigma Chips)
- 1 MEGABYTE OF 32-BIT DYNAMIC RAM ON BOARD. OPTIONAL 4MB ON MOTHERBOARD, 16 MB USING LOW COST RAM
- 6 AT-Compatible 16-bit slots; 2 XT-Compatible 8-bit slots
- Realtime Clock/Calendar
- 80287 or 80387 Co-Processor Capability
- ELEGANT, HEAVY-DUTY VERTICAL CASE (Not a PC Stood on End)
- TWO FLOPPIES—1.2MB 5.25 AND 1.44MB 3.5 (Others sell only a 1.2 MB and charge up to $200 for the 1.44MB Drive)
- 65 MB HARD DRIVE WITH DISK CACHING (For virtually zero-wait read/write access)
  - 14 INCH 1000 LINE FLAT SCREEN MONITOR (A $149.00 added value at no extra cost)
  - STD Herc. Graphics Card Supplied.
  - Our Own Insta-Cache program—up to 1.6MB of instant-access disk caching. Makes disk read/write access near zero-wait!
  - The superb Golden Bow Systems VOPT disk optimizer, another Northgate Exclusive. Super-fast disk organizing program keeps hard drives operating at "factory-new" performance!
  - MS-DOS 3.3 (the most current version) with GWBASIC in bound covers.
- OUR EXCLUSIVE "C/T" 101 KEYBOARD Nationally advertised at $99.00.
- Fully Compatible with Novell, MS-DOS, Microsoft OS/2, Xenix, Unix AND VIRTUALLY ALL 286 SOFTWARE
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PC MAGAZINE REPORTS..."PC Labs tested drive

AND NORTHGATE'S 80286

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Find out if your "zippy-fast" hard drive system is REALLY in the fast lane. Send us $5.00 cash, check or money order and we'll send you the THRUPUT test program. In seconds you'll know how your system compares to Northgate systems. And when you buy a Northgate system, we'll refund the $5.00!

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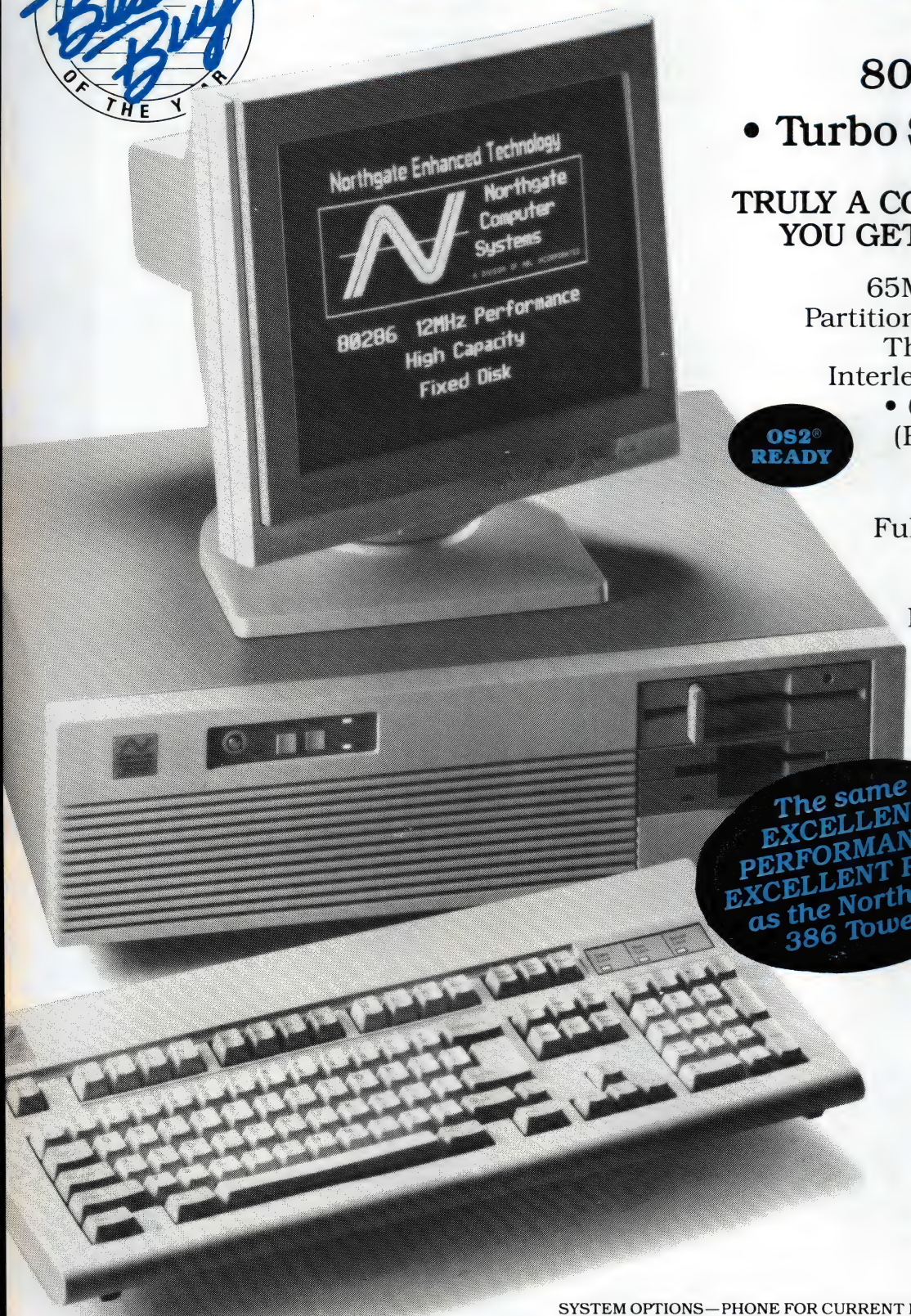
Now, with Northgate Super 286

Turbo Throughput™

COMPUTER SHOPPER '87 Best Buy OF THE YEAR



800,000 Bytes Per Second Data • Turbo Speed Hard Drive Controllers

TRULY A COMPLETE, READY TO USE SYSTEM YOU GET ALL THESE QUALITY FEATURES:

65MB Miniscribe Hard Drive, Formatted and Partitioned 32.5MB in C and D Partitions • Turbo Throughput 16-Bit Hard Drive RLL and 1:1 Interleave Controller • 12MHz Processor Speed • 6 16-Bit, 2 8-Bit Expansion Slots • 1.2MB (Reads & Writes 360K Disks) AND 1.44MB Drive (Reads & Writes 720K) • 200 Watt Power Supply • 2 Parallel, 1 Serial Port • Full Size (Not Baby Size) Case with Keylock, Turbo On/Off, Indicator Lights • 14 Inch Tilt/Swivel Flat Screen Amber Graphics Monitor with 1000 Line Resolution Capability for CAD • Hercules Compatible Graphics Card • Latest Version MS-DOS 3.3 with GWBasic including hardbound manuals for both (Northgate is a Microsoft OEM Licensee).

OS2® READY

The same EXCELLENT PERFORMANCE, EXCELLENT PRICE as the Northgate 386 Tower.

AND NOW, TO GIVE YOU EVEN GREATER PERFORMANCE...

DRIVE CACHING AND VOPT™ OPTIMIZER ARE INCLUDED!

Installed on your hard drive is Northgate's exclusive Insta-Cache™ Hard Disk Caching program. Once a file is read it's in cache. Retrieving it again is 0-wait. No hard drive access is needed. This is an $80.00 value, yours at no extra cost. AND...WE ALSO GIVE YOU THE BEST DISK OPTIMIZER PROGRAM EVER—VOPT™ BY GOLDEN BOW SYSTEMS. CLEANS UP FRAGMENTED SECTORS AUTOMATICALLY EVERY TIME YOU START YOUR SYSTEM. A $50.00 VALUE, AGAIN YOURS FREE WITH THE NORTHGATE 286.

SYSTEM OPTIONS—PHONE FOR CURRENT PRICING: EGA, EGA+; MFM HARD DRIVES, ESDI & SCSI TO 300MB; STREAMING TAPE BACKUP; HARD DRIVE BACKUP FROM $389; MEMORY EXPANSION CARDS; CO-PROCESSORS.

400% Faster Performing
WORLD CLASS QUALITY
Features Unmatched Anywhere

The Bottom Line

$2199.00 complete as shown

throughput on all the (21) machines in this review, (Feb. 16, 1988)
WAS THE FASTEST...

65MB Hard Drive System you get:

Computing Power

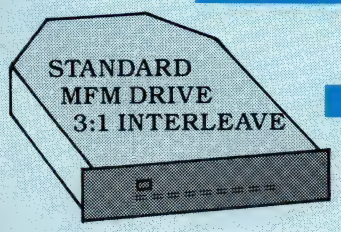
More!

Transfer Rate • RLL Encoded Hard Drives • 1:1 Interleaving • World's Highest Performance AT Class Computer System!

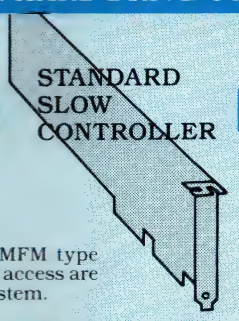
HERE'S THE SECRET OF TURBO THROUGHPUT

THE ADVANCED DESIGN THAT MAKES THIS SYSTEM PERFORM 400% FASTER THAN OTHER AT TYPE COMPUTERS AS THEY ARE COMMONLY CONFIGURED AND SOLD BY MOST VENDORS IN THE PC INDUSTRY!

COMMON HARD DRIVE CONTROLLERS



Other vendors supply only MFM type drives. Even these with 28MS access are slower than the Northgate System.



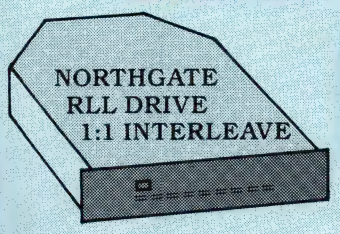
Virtually no controllers can do RLL and 1:1 interleaving—thus slow down data transfer.

200,000 DATA TRANSFER RATE

ORDINARY PARTS = ORDINARY PERFORMANCE

Data Transfer, the true measure of computer performance, cannot exceed 200,000 bytes per second in getting data to the computer's processor.

NORTHGATE HAS 400% FASTER SYSTEM PERFORMANCE!



Northgate's unique Hard Drive is RLL Encoded (50% more formatted capacity) AND with 1:1 Interleave reads/writes data faster than 28ms drives.

Northgate's 16-Bit Turbo Throughput Controller enables our high speed Data Transfer rate.

800,000 BYTES PER SECOND DATA TRANSFER RATE 400% FASTER

NORTHGATE SYSTEM IS 400% FASTER

Northgate Delivers System Performance Unmatched by Other Vendors. Ask them and prove it to yourself!

Most computers look similar. Most vendors advertise processor speed and 28MS hard drive access. There is little to distinguish one from another. Thus everyone tends to assume all computers are alike.

NOT SO. Northgate is truly a different System. And because it is, the computer buyer gets far greater computer value for his money. That's why Northgate has soared in popularity. Those who know choose Northgate. They know they get value through performance that's demonstrated every time they turn on the system. They know all parts are World Class, not the ordinary "off the shelf" items others use to keep costs down.

Northgate pioneered RLL Hard Drive and 1:1 Interleaving in its 286 systems. To our knowledge, no competitor even offers these vital performance features. Call them. We did. Only Northgate gives you this unique throughput-enhancement.

If Northgate pricing seems higher, don't be deceived by Bare Bones Prices you see in others' ads. Northgate's System is complete—IT'S THE 286 SYSTEM YOU WON'T OUTGROW! We encourage you—Shop Around, Call all the Others and Compare.

ALL THIS PLUS...The Computer Industry's Most Meaningful Service and Warranty Policy...

30-Day Compatibility Warranty:
Northgate guarantees its systems will operate any standard, commercialy available DOS programs written for use on IBM Compatible Computers. If, on consultation with Northgate, a program cannot be made to operate satisfactorily, owner may return the system, complete and unaltered for a prompt and full refund including all freight costs.

One-Year Overnight AT NORTHGATE EXPENSE Parts Replacement Warranty:
Northgate Computer Systems warrants that all systems sold by Northgate will be free of defects in workmanship and materials for one year from date of shipment.

- In the event of failure of a part that disables the system Northgate will ship, the same day if notified by 12 Noon Central Time, a new replacement part. Customer must phone Northgate Customer Service for diagnosis of the failure.
- Shipment of the replacement part will be by overnight-express service—AT NORTHGATE'S EXPENSE—for next day delivery depending on the carrier's ability to provide such service in owner's geographic area.
- Owner must return any replaced part, complete and unaltered, and pay return shipping costs, to be received at Northgate within two weeks after receiving the replacement part.
- Northgate's Customer Service department will provide full instructions on making the repair or replacement and will consult with customer on the phone to assure repair is properly completed and the system is again operating.
- In the case of a complete system returned for repair under warranty, customer pays freight to Northgate and Northgate pays return freight by whatever service the system is sent to Northgate.

In the event of a part replaced under warranty, the new part carries a NEW ONE-YEAR GUARANTEE FROM SHIP DATE!
NOTE: Many computer vendors extend only the parts manufacturer's warranty which may be as little as 30-days. All products sold by NORTHGATE are fully guaranteed by Northgate for one year from date of shipment.

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A DIVISION OF ABL INCORPORATED

13895 INDUSTRIAL PARK BLVD., SUITE 110
PLYMOUTH, MINNESOTA 55441

HOURS: Mon.-Fri. 8A.M.-7P.M. CST, Sat. 9A.M.-3P.M.

USE OUR TOLL FREE ORDER LINE

800-548-1993

VISA MC COD TERMS: Credit Card, Pre-Payment (allow 2 weeks for personal checks to clear) Wire Transfer and Purchase Orders for Rated Accounts. We also ship to APO and FPO. All shipments are FOB Minneapolis, MN

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"...12 function keys on the left where God intended them..." revolutionary and much needed...Better than any replacement keyboard...duplicates the responsiveness and tactile feedback of the original IBM keyboard...A viable alternative to IBM®'s own model...durable, well-designed, sensible and has just the right feel..."

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"I was surprised to discover how {Northgate's} keyboard increased my productivity. My ears can tell when my fingers have mistyped, and when I'm flying across the keys, my fingers get the kind of feedback they evidently need."

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"Typing on the {Northgate} is more comfortable than on any of the replacements I've tried."

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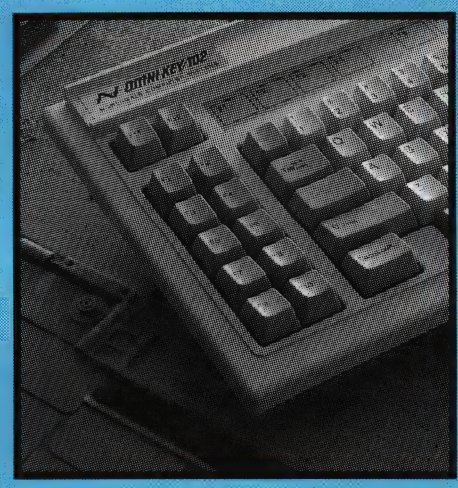
ONLY **$99.00**

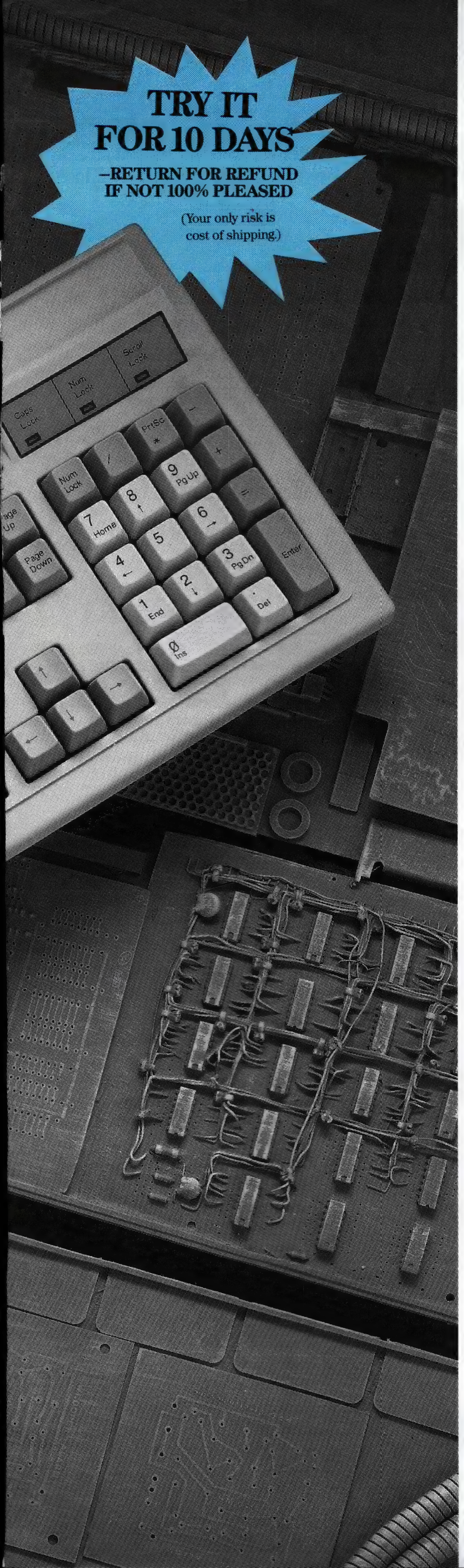
WHY
WE PUT THE
F KEYS ON THE LEFT

Most people learned keyboard typing on boards with the F keys at the left. That's where they're most convenient and easiest for the left hand to use them. Both hands stay in place as typing school teaches. Speed and accuracy increase and production soars.



Now! PS/2™ Compatible!

YES, OmniKey can be used with IBM PS/2 models 30, 50, 60, 80 ONLY $25.00 additional.



Created and Marketed only by:

Northgate

OmniKey/102™

FOR XT, AT, 386 TYPE SYSTEMS

Northgate Designed Omni Key/102 In Response To Countless Users Who Demand Better Layout, Better Touch And Positive Entry Feel!

Features You'll Find Only in the OmniKey/102

- Compatible with the IBM® enhanced keyboard including a Sys Rq. key for mainframe access.
- The 12 Fully Programmable Function Keys are positioned on the left where everyone told us they belong for increased typing efficiency.
- Exclusive Northgate Click/Tactile touch using Japanese made ALPS sealed electro-mechanical key switches rated for virtually a lifetime of use.
- Three-Year UNCONDITIONAL WARRANTY. Anything breaks, we fix or replace free.
- LED light panel for CapsLock, NumLock and Scroll Lock (IBM doesn't have lights)
- ESC, CTRL, SHIFT, ALT keys are color coded Red, Green, Blue for WordPerfect® users. Vertical templates fit, too!
- Enter Key is jumbo sized, L-shaped. BackSpace key is double-width. Both Shift keys are oversize for error-free operation.
- CTRL, SHIFT, ALT Keys are aligned on left side.
- ESC key is where it belongs, next to No. 1 on the top numeric row.
- CTRL key is where you expect to find it, too, next to letter A.
- CapsLock key is next to space bar.
- 9 Cursor and screen control keys on separate pad.
- Four separate cursor arrow keys.
- Full Numeric Keypad AND WE'VE EVEN ADDED AN (=) KEY FOR FULL REDUNDANCY WITH TOP NUMERIC ROW. Spread sheet users and accountants love this feature.
- 12 window pencil-in strip so you can customize Function Key notes to yourself.
- Built to last with full metal base (many keyboards are all plastic). Omni Key/102 has a solid, 5.5 lb. "sit down on your desk to stay feel".
- New Slim-Line ergonomic profile.
- Pop-up back legs adjust typing angle for maximum comfort.
- 100% Novell ELS Compatible.

More!

NORTHGATE Also Offers the 101-Key Standard AT Style and 84-Key XT Style, Both With the Same Touch.

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Compatibility Notes: Requires standard 5-pin circular connector as on most IBM standard computers and compatibles... Not compatible with: Some early IBM PC's, PC's Ltd, All AT&T, some Zenith and Tandy. If uncertain contact your computer supplier.

Northgate will accept COD and purchase orders from credit-worthy buyers for quantities totaling $500.00 or greater. For quantity prices phone our corporate headquarters 612 553-0111. FAX orders to 612 553-1695.

SHIPPING: Allow 5 days for order processing before shipment. Thereafter, shipments can be:
1.) UPS Ground add $7.00; allow 2-3 weeks for delivery.
2.) UPS Second Day add $12.00;
3.) UPS Overnight add $22.00 for each board.

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Yes. Ship my Omni Key/102 order(s). I understand I may use it for 10 days and if I wish, may return it for full product cost refund. I agree to pay for freight both ways.

Name _____

Company _____

Ship to (Address) _____

City _____ **State** _____ **Zip** _____

Phone _____

Computer Brand & Type _____

Please ship the following:

QTY.	ITEM		FREIGHT	TOTAL
____	Omni Key/102	**$99.00**	$_____	$_____
____	C/T 101	**$99.00**	$_____	$_____
____	C/T 84	**$79.00**	$_____	$_____
____	PS/2 Model (Add for ea.)	**$25.00**	$_____	$_____
TOTAL OF ORDER				$_____

Prepaid amount enclosed $_____

Please charge to my ☐ Visa ☐ MasterCard Account

Card No. _____ Expires_____

Signature of Cardholder_____

(My signature authorizes a charge to my account for the above merchandise prior to shipping to initiate processing of my order.)

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You'll be connected to a Northgate Account Manager. In an instant, you'll know you're dealing with a professional. An individual who is trained in depth. Who understands computers and more importantly, understands people like yourself.

You'll immediately feel confident, because your questions will receive intelligent, careful consideration. And you'll get the truth. About what Northgate can and possibly cannot do for you. (If you're strictly shopping for the lowest price without considering quality and performance—don't call).

But if you want the most computer for your investment...a system that runs rings around the others you'll find in this magazine...

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The Most Meaningful Warranty In The Computer Industry...

Here's the stunner! If anything in your Northgate System goes down and disables your computer, Northgate guarantees to ship the proper replacement part OVERNIGHT AT OUR FREIGHT EXPENSE.

YES...you get a brand new part—be it the largest and most expensive hard drive, VGA monitor, to the smallest part—and it's shipped to you BEFORE YOU RETURN THE OFFENDING PART.

Check with our competition. In most cases, they must get the part back before you get a replacement. Often that's weeks. And you sit there, out of business until they get the old part repaired or replaced.

Northgate's phone tech crew is there to back you up. Unlimited phone help is available for as long as you own your Northgate. And for one year, you're protected with Northgate's Overnight Parts Replacement Warranty. If a system needs to come back for service, all parts and labor are FREE unless damage is caused by the end user.

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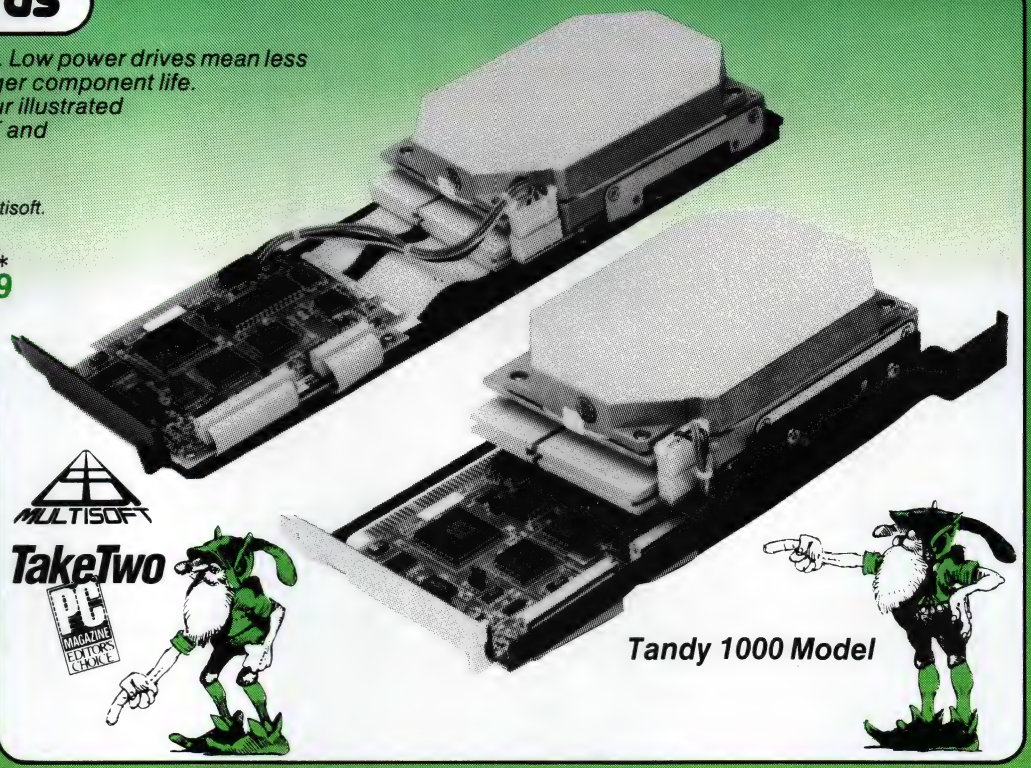
Leprecards feature components utilizing the latest technology. Low power drives mean less strain on your systems, lower operating temperature, and longer component life. You get a 1 year warranty, unlimited technical support, and our illustrated installation and user's guide. Models available for IBM PC/XT and compatibles, as well as TANDY 1000/A/SX/TX/TL/SL.

FREE SOFTWARE *Including* ***TakeTwo,*** *the backup utility PC MAGAZINE named Editors Choice in 1986 & 1987, and* ***PC-KWIK*** *disk cacheing from Multisoft.*

21MB 48ms	32MB 48ms	40MB 70ms*	49MB 28ms*	65MB 16ms*
$299	$339	$449	$549	$649

* *Average access speed per partition*

Tandy 1000/A/SX/TX/TL/SL Leprecards add $20



3.5" Floppy Kits

Internal kits for PC/XT/AT computers include 5¼" mounting brackets, black & gray face plates, and AT rails. 1.44MB for PC/XT includes high speed Western Digital controller.

FREE TAKE TWO *floppy backup software.*

720 Kit	1.44MB for AT	1.44MB for PC/XT
$109	$139	$199

PC/XT Disk Kits

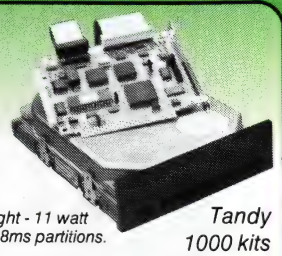
- *Pretested & formatted*
- *Western Digital short slot controller*
- *30 page installation guide & reference manual*
- *Cables, mounting screws, full & half-height face plates*
- *1 year Warranty, 30 Day Money Back Guarantee*
- *Optional: 150 watt, UL/FCC approved power supply for IBM PC's $69*

20MB KIT $279
- *Seagate ST225 - 21.4MB/65ms. Half-Height/14.8 watts*

30MB KIT $299
- *Seagate ST238 - 32.7MB/65ms. Half-Height/14.8 watts*

40MB KIT $459
- *Seagate ST251 42.8MB - Half- Height - 11 watt*
- *pre formatted into a pair of 21MB/28ms partitions.*

65MB KIT $549
- *Seagate ST277R 65.5MB - Half-Height - 11 watts*
- *pre formatted into a pair of 32MB/28ms partitions.*



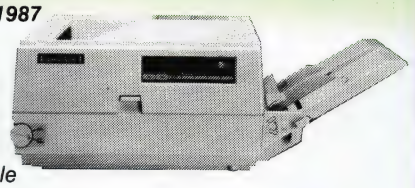
Tandy 1000 kits add $20

FREE SOFTWARE *Including* ***TakeTWO,*** *the backup utility PC MAGAZINE named Editors Choice in 1986 & 1987, &* ***PC-KWIK*** *disk cacheing from Multisoft.*

Laser Printer

512K	1.5MB
$1495	$1595

"One of the Laserjet's strongest competitors"
INFOWORLD October 5, 1987



- *Printer utility software*
- *Serial and Parallel Interfaces*
- *120 day TRW on site maintainance*
- *1 year Warranty*
- *100% HP Laserjet, & Laserjet + compatible*
- *9 resident & 5 downloadable soft fonts standard*
- *Options: All HP style font cartridges*

Toner Cartridge $29

AT Hard Disk Kits

- *Includes IBM AT rails, and cables.*
- ***SpeedStor*** *or* ***Ontrack*** *large drive software.*
- *Formatted, Partitioned & Tested.*

SIZE	MODEL	SPEED	CAPACITY	PRICE
HH	Seagate ST251	40ms	42MB	$359
HH	Seagate ST251-1	30ms	42MB	$449
HH	Toshiba Drive MK134	25ms	44MB	$499
FH	Seagate ST4096	28ms	80MB	$599
FH	Maxtor 1140	27ms	117MB	$1669
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LepreFAX Modems

Internal	External
$289	$359

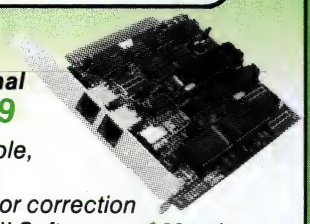
- *Easy to use POP-up Menus*
- *Sends ASCII or word processing files*
- *Internal 4800bps, $289 9600bps $559*
- *Prints on stardard dot-matrix or laser printers*
- *Sends/Receives from any Group 3 fax machine*
- *Automated sending during low phone rate periods*
- *Portable external plugs into PC/XT/AT serial port, $359*

4" Hand Scanner with HALO DPE software **$269**

2400 Modems

with MNP

External	Internal
$239	$229

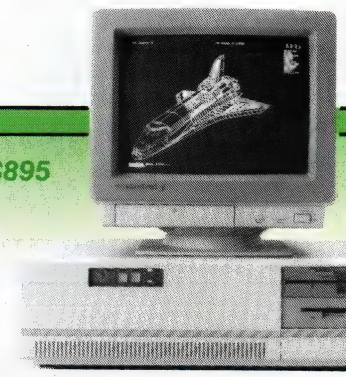


Hayes Compatible, 300/1200/2400
MNP Level 4 error correction
FREE *MIRROR II Software, a $69 value*
Internal model $229, fits in a short slot

2400 without MNP *$159* **Ext** *$109* **Int**

Orchid

Designer VGA 512K	$299
Orchid VGA 256K	$249
Tiny Turbo 286	$289
Ramquest II 1MB	$799



286[10] Computer

$895

80286 processor running at 6/10 Mhz with 0 wait states provides a Norton SI rating of 11.5. 8 slots - Room for 1 full and 3 half-height drives-220 watt power supply - clock/calendar - Choice of 1.2 or 1.44MB floppy drive-Genuine Western Digital combination Hard disk/floppy controller-American made Maxiswitch 84 or 101 key keybroad - 512K RAM standard expandable to 1MB Award BIOS- 1 year warranty - 30 day money back guarantee.

Complete systems with serial & printer ports:

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New 4.0 Version!
Now directly import your dBase III files.

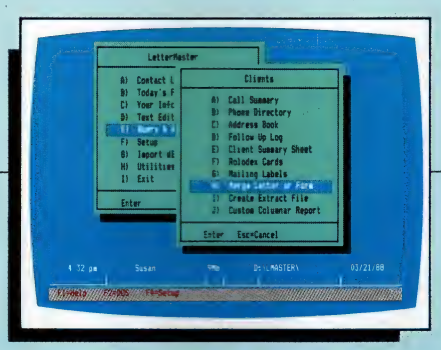
Master your mailings in minutes

LetterMaster™

Client Management / Mail Management

4:30 "Susan—Send our sales letter to all buyers of apples and cherries in Washington and oranges or bananas in Florida, in time for today's 5:00pm pick-up.—Mr. Wermer."

4:32 Mailing lists sorted.

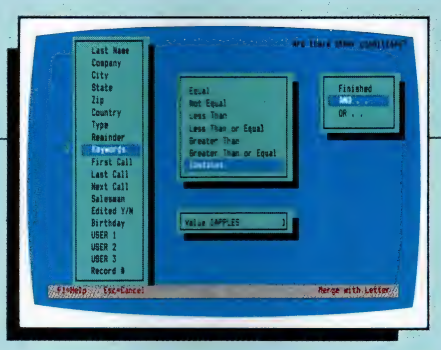


Our new LetterMaster mailing software is a lifesaver. It sorts any list according to any criteria in its own internal database and our dBASE® III files.

4:33 Lists merged and purged.

LetterMaster merges lists and purges duplications in a matter of seconds. It's incredible! I can create instant custom mailing lists with a few keystrokes!

4:38 Personalized sales letters printed.

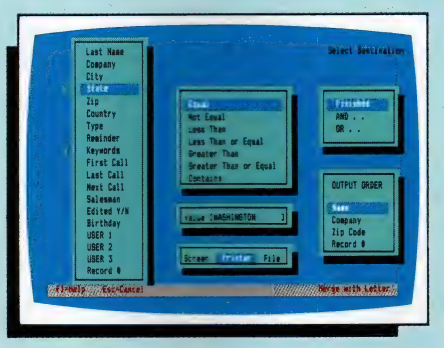


With LetterMaster, all I do is name the list, name the letter, activate the printer, and "go do." It's that simple!

4:41 Labels printed.

LetterMaster prints off any list onto leading brand address labels. It prints Rolodex cards and file folder labels, too.

4:45 Mailing complete and ready for pick-up.



LetterMaster operates with all the popular word processing programs. About the only thing it doesn't do is lick the envelopes!

System requirements for Single User: DOS 2.1 or higher. IBM PC or your IBM PS2, or 100% compatable. 512K RAM. System requirements for Network Work Station: DOS 3.1 or higher. 640K RAM, any combination of hard, floppy, or no disk drives. Trademark/Owners: LetterMaster/Dilg Properties, Inc.; dBase III/Ashton-Tate Corp.; IBM PC & IBM PS2/International Business Machines Corp.; DOS/International Business Machines Corp. and Microsoft Corp.

5:00 "Susan—Good work on that mailing.

Have an apple.—Bob"

Only $189

Multi-user systems: $495.00

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- The smallest, lightest portable PC – just 6.4 pounds
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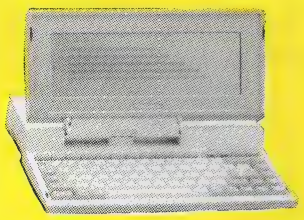
- MS-DOS 2.11 in ROM
- Built-in 720K, 3.5" floppy drive
- Bright, 80 x 25 character supertwist LCD
- 640 x 200 bit-mapped graphics
- IBM CGA compatibility
- Dimensions 12.2" W x 2.05" H 11.0" D

$775.00



T3100/20 Portable Personal Computer

- The power of an IBM PC-AT in a 15-pound package
- 80286 CPU running at 8 or 4MHz
- 640K RAM, expandable to 2.6MB
- 20MB hard disk
- 3.5" 720K floppy drive
- High-res 80 x 25 character gas plasma screen
- 640 x 400 bit-mapped mono graphics capability
- IBM CGA compatible
- Dimensions 12.2" W x 3.1" H x 14.2" D
- Weights 15 pounds

$2,880.00

T1200 Portable Personal Computer

- The industry standard battery powered portable PC
- 80C86 CPU running at 9.4 or 4.77MHz
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Choices of different configurations –

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Dual 3.5" 720K floppy drives
Weights under 10 pounds
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T1200H –
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20MB hard drive
Weights under 11 pounds
Dimensions 12.2"W x 2.6" H x 12"

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T1200HB –
one 3.5" 720K floppy drive
Backlit LCD
20MB hard drive
Weights under 11 pounds
Dimensions 12.2"W x 3.0" H x 12"

$2,400.00

PORTABLE PERSONAL COMPUTER

T5100 Portable Personal Computer

- The ultimate in portable computer performance
- Full desktop capabilities in a 15 pound package
- 80386 CPU running at 16 or 8MHz
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- High res gas plasma screen with four gray scales and adjustable contrast
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- 640 x 400 pixel graphics display
- Dimemsions 12.2" W x 3.5" H 14.2" D

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T3200 Portable Personal Computer

- The desktop computer that's never desk-bound
- 80286 CPU, running at 12 or 6MHz, keyboard selectable
- 80287-8 coprocessor socket
- Real time clock/calendar
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- 40MB hard drisk with 38 msec. access time
- 3.5" 720K floppy drive
- 1MB RAM expandable to 4MB
- High res gas plasma screen with four gray scales and adjustable brightness and contrast
- 80 x 25 high res character display
- 640 x 400 pixel graphics display
- Dimensions 14.6" W x 3.9" H x 15.6" D
- Weights 19 pounds

$3,695.00

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- 80286 6/12 MHz SYSTEMBOARD
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- FDD/HDD CONTROLLER
- 101-KEY ENHANCED KEYBOARD
- 200 WATT POWER SUPPLY
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$745.00*

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- same configuration as the 286 12MHz system above.

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386 20MHz SYSTEM

- 80386 16/20 MHz SYSTEMBOARD
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W/ 1MB ON BOARD

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- 150 WATT POWER SUPPLY
- 84-KEY AT STYLE KEYBOARD
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- game port
- parallel printer port
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without affecting the rest of the users. The modular architecture also allows the OEM to download some of the graphics management overhead to specialty hardware such as the SunRiver Fiber Optic Stations. The protected mode operation ensures that a crash on one console does not affect other consoles.

X/GEM drivers available today allow the use of a variety of graphic displays, and input and output devices. The FlexOS and X/GEM driver interface is open and thoroughly documented so that drivers for the SunRiver terminals, Viewport's multi-tasking graphics boards, and other platforms can be implemented.

FlexOS 386 is strictly an OEM product. A complete development kit consists of four large binders and a dozen disks, and costs $2995. Included are the operating system's User's Guide, the Programmer's Reference Guide, the System Builder's Kit, and Metaware's High-C compiler.

SmartScreen 386
From Concurrent Controls, Inc.

If Digital Research operating systems appear to dominate this section, it's because they have been involved with multi-user operating systems longer than anyone else in the DOS marketplace. SmartScreen 386 is also a CDOS derivative. CCI is one of DRI's Master VARs who implement Concurrent DOS for specific vertical market applications and large-scale networks for OEMs, System Integrators and corporate markets.

SmartScreen 386 has had its ups and downs. Its first multi-user graphics implementation was due out early in 1988, but the hardware developer couldn't bring the manufacturing costs in line and abandoned the project. CCI then worked with AMR on a port to the Video Network Adapter; but just at the point where the operating system software was ready for release, AMR accepted an exclusive marketing arrangement from The Software Link.

SmartScreen 386 is finally available on Viewport Technology's multi-user EGA system. Judging from the preliminary plans that were sent to me, I think this relationship will grow into some interesting joint marketing ventures.

Viewport is also developing a multi-user monochrome graphics board for CCI in order to satisfy the demand for a low-cost hardware solution, plus other products that will be announced at the Las Vegas COMDEX. Since the Viewport multi-user graphics cards will have a compatible BIOS, CCI will ultimately merge their support for the monochrome, EGA and VGA platforms, so that systems can be integrated with both monochrome and color graphics monitors. For many installations, users can draw on their inventory of monitors and keyboards from old PC and XT computers. In this fashion, a single 386 host computer becomes a multi-user system.

When the host is upgraded with more memory, a math co-processor for faster bit-mapped graphics manipulation, larger capacity disk drives, etc., the benefits will affect all users on the system. The ultimate savings in upgrading a single computer that serves 16 users far outweigh the costs of upgrading 16 computers with the same hardware enhancements.

Smartscreen 386's documentation includes Digital Research's CDOS 386 User and Reference Guides. As with all their customized Concurrent DOS operating systems, they have added a Reference and Installation manual specific to the hardware platforms supported in this release version.

The operating system is self-installing and functions exactly like Concurrent DOS. However, as CCI provides additional hardware support over the retail edition of CDOS, users can select their installed options from a menu screen. Once the options have been chosen, the operating system attaches them to the kernel where they remain active until changed.

Smartscreen 386, running on Viewport's Multi-User EGA hardware, supports 4 multi-tasking windows on each virtual console on the host computer, plus 2 multi-tasking windows on each terminal. The first release for the Viewport monochrome graphics hardware will also support 4 windows on the host, but only 1 on each terminal.

The second release version due late in the 4th quarter of 1988 will add a second multi-tasking window to each terminal. Each monochrome host adapter system will support 4 users. Four host adapters can be installed at the main console for a total of 16 users. With the addition of CCI's implementation of DRI's DR NET, clusters of workstations can be chained together through ACNET and other standard network boards and connected to a mainframe. CCI's current implementation of DRI's network will support 256 simultaneous users.

There are no plans by CCI to support the SunRiver hardware because DRI and its VARs do not compete with one another in the same markets. While DRI's CDOS 386 MGE edition is strictly a retail product, CCI's Smartscreen 386 will be customized for special software applications for the business, legal, engineering, and medical markets. Their products are sold only through authorized resellers and VARs.

PC-MOS/386 VNA
From The Software Link

PC-MOS/386 made its appearance early in 1987. It is the only multi-user DOS compatible operating to be released since Concurrent DOS. This is providing a healthy competitive development and marketing environment for The Software Link and DRI. A competitive environment means that enhanced operating facilities for the end user will be forthcoming much more frequently.

While CDOS emulates the PC DOS command structure, PC-MOS has created its own command set. A few commands such as COPY, DIR, DISKCOPY are the same as DOS, but the vast majority of commands are unfamiliar and require a protracted learning process. PC-MOS/386 grew out of software technology The Software Link had developed for its networking hardware, The LANLink, which is the only network currently supported by this operating system.

It has a very basic kernel and a limited set of built-in system drivers. Most device drivers that an operating system requires to access physical hardware must be installed in a CONFIG.SYS or Batch file. This includes the video display, which in other operating environments will automatically default to the display mode attached to the computer. This has caused some VARs to equate it to a patchwork quilt.

The reason for this appears to be the highly modular architecture and its ability to work across several generations of hardware. PC-MOS/386 isn't an exclusive product for the 80386 processor. The operating system can be loaded onto 80286 AT and 8086 XT based computers with the inherent limitations imposed by these processors. The operating mode takes advantage of the 80386 native mode and the virtual mode of the 8088. Expanded memory is supported under the LIM (Lotus-Intel-Microsoft) specifications.

While CDOS emulates the PCDOS command structure PC-MOS has its own command set.

Having a modular architecture does simplify porting to unique graphics hardware environments such as AMR's Video Network Adapter, but it increases the complexity for the user. If drivers that aren't executed in a prescribed sequence the system crashes. If PC-MOS/386 is going to be used with IBM's PS/2 computers, specific drivers have to installed before the two entities will work together. In the final analysis, the concept of the operating system is specifically oriented toward The Software Link's own proprietary PC Emu-Link and LANLink 5X networking hardware. Other multi-user solutions that offer network support are structured in a way that the network support is transparent to the operating system. This will allow them to work across a wide range of network systems and communications protocols.

There is nothing wrong with this approach. When a company has both hardware and operating systems software divisions, basic marketing principles dictate the necessity of having a compatible relationship with each other. It is also a way of leveraging an increased customer base.

The PC-MOS/386 VNA edition, like the standard release version, allows for multi-tasking only at the main console. Terminal or station users may run only a single application. TSR (Terminate and Stay Resident) programs can only be run on the main console. I suspect this limitation is a result of having to cope with previous PC hardware generations. The operating system should have been designed in processor-specific versions that took advantage of each Intel family CPU, instead of defaulting to the least versatile processor. This would enable a 386-specific version to exploit the advanced memory management techniques of this processor.

A total of 16 users may share the resources of the VNA hardware system. The only station that can run mouse-driven windowing applications is the main console, as there is no serial I/O support available on the VNA without the addition of the Serial Adapter board discussed in the AMR section. When local mouse ports are required, the effective size of the multi-user cluster is reduced to eight.

Concurrent with the VNA VGA hardware release in October, 1988, The Software Link will also be releasing support drivers for the SunRiver Fiber Optic terminals. A PC-MOS/386 driver is being developed by Viewport Technology for their Multi-User EGA hardware.

PC-MOS/386 cannot reside in the same hard disk partition as PC/MS-DOS. It requires its own boot code be present on the boot track sector. If you attempt to install PC-MOS/386 on the same logical hard disk partition, it will overwrite the existing DOS boot track. You can, however, set up DOS on one partition and PC-MOS/386 on the another, and configure the system to boot from whichever operating system you wish—a feat I haven't been able to duplicate. PC-MOS/386 allows the creation of larger hard disk partitions than the conventional 32MB, but doing so may impair the ability to run certain applications.

PC-MOS/386 batch files aren't always fully compatible with their DOS equivalents. Some programs that set up complex parameters during the installation process under DOS may not be directly accessible by PC-MOS/386. If this problem surfaces in your PC-MOS/386 system, simply reinstall the program under the new operating system.

Like the other multi-user operating systems in this group, PC-MOS/386 works best when it is the stand-alone operating system within the computer, especially in AT or 386 systems. Large capacity hard disk drives usually shipped with these computers require the assistance of special disk management utilities to create what DOS can't do (a limitation that will be gone with the DOS 4.0 release). Their bag of tricks often play havoc with multi-user operating systems. It is generally recommended that you throw out DOS and go with the multi-user operating system's facilities to create your hard disk partitions.

Although the PC-MOS/386 User Manual is quite extensive, it doesn't yet contain the necessary details on how to install and use the new AMR multi-user graphics engines. Some details are in a text file on the system disk. The bulk of the technical information is included with the hardware documentation. The PC-MOS/386 VNA edition is sold only in conjunction with the

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AMR hardware. A complete 4-user system costs $2,995.

DOS Compatible Control Programs

DOS compatible control programs extend the operating environment of PC/MSDOS in such a way that it is tricked into supporting multi-users and/or multi-tasking. Both Quick Connect from Virtual Systems, and VM/386 from IGC, are deeply rooted in the virtual machine architecture of IBM's 3270 mainframe operating system, but offer distinctly different operating platforms.

Quick Connect/386
From Virtual Systems

Virtual Systems has been in existence since 1970 providing custom programming, compilers, assemblers, microprocessor development tools, and software engineering for the mainframe industry. Based on their knowledge of mainframe operating systems, they have created a series of processor specific multi-user control programs called Quick Connect, which overcome the single-user limitation of PC/MSDOS.

By using the resources of the DOS operating system and wrapping a virtual machine control program around it, DOS becomes a multi-user operating system that can support standard PC, ANSI-Standard, and ASCII terminals through any standard multiport serial I/O board on the market. Many of the features incorporated into Quick Connect have been derived from network programs, which include shared program directories, user ID's, file and record locking mechanisms, a print spooler, modem and network communications, and other neat features.

Quick Connect also has an EMAIL utility that routes all messages through a memory "pool" which can be set up to automatically inform a new user logging onto the system if a message exists for him. Messages can be displayed and edited through a window. EMAIL also enables you to send text files to word processors and other programs that may reside in the main console's hard disk.

Quick Connect is not compatible with any EMS/LIM Expanded Memory Managers. These programs try to operate in the protected mode and will not function properly in the Virtual-86 mode that Quick Connect requires. Quick Connect/386 will use the base memory (640K and below) and all of the expanded and extended memory that your system has installed to form a memory "pool" from which user partitions are allocated. The program has its own expanded memory driver that can be installed through a CONFIG.SYS file so that it is available to users who may need it for applications that can page into expanded memory. Upper limits can be set to prevent an application from stealing more expanded memory than necessary.

Although Quick Connect operates in a virtual machine environment, using a CTRL-ALT-DEL from any station should only be used as a last resort if a program locks up. There is no guarantee about the state of DOS when you perform an abort. The preferred procedure under normal conditions, when changing programs, is to exit and log in again.

After Quick Connect has been configured to your hardware environment, it is loaded into a separate sub-directory on any hard disk partition you specify. You access the program by typing QC (to load Quick Connect), and then VMM (which loads the Virtual Machine Monitor). This command set can be incorporated into an AUTOEXEC.BAT file. At this point you have DOS, Quick Connect and the virtual machine environment resident on your system.

Quick Connect has an EMAIL utility which routes messages through a memory "pool."

The visual interface has the familiar DOS command prompt, and you can initiate any DOS action, as well as any of Quick Connect's built-in commands described earlier. When a user logs in by entering his ID, he requests a specific amount of memory and indicates by letter the type of display on his terminal. Quick Connect will allocate the desired memory from the memory pool for the user's virtual machine. The actual amount of usable memory will be somewhat less because a portion of that memory has to be allocated for the user's visual display. When a user logs off, his memory goes back into the pool. If a user needs additional memory, he can use the SHOW MEMORY command to let him know how much memory is installed in the computer and how much of that is free.

Installation of the SunRiver Fiber Optic workstations is quick and painless. Quick Connect will support 4 host adapters and up to 16 terminals. Virtual Systems has designed a menuing system from which all options and port assignments are selected. Certain defaults are already in place. You can confirm these or type in alternate ports. If you don't understand an option or the ramifications it might have on your system, the F1 key brings up an on-line help menu.

Quick Connect supports I/O redirection through the REDIR command. Normally, programs that directly access the I/O ports for COM1, COM2, and LPT1, are directed to the I/O ports on the back of the SunRiver workstations. This is the correct action for programs like MOUSE.COM device drivers. Other programs, like AutoCad, when it's using the plot facility, may need their I/O ports redirected back to the main console's serial ports (i.e., COM2). The REDIR command may be used to perform this I/O redirection.

Driver support has also been incorporated for the IntelliPort and ATvantage intelligent serial controllers. This allows you to configure several standard RS232C serial terminals to coreside on a system containing SunRiver terminals. It is also possible to configure and attach serial terminals to the back of a SunRiver workstation and use them in conjunction with certain CAD programs that require interactive text and plotting.

This edition of Quick Connect supports the SunRiver EGA system. The monochrome stations can be used, but only for monochrome text (MDA) applications. The Hercules graphics capabilities of the SunRiver monochrome workstations are expected to be incorporated in the next release, which is scheduled for early fall, 1988. This edition should also include the drivers for SunRiver's VGA workstations.

Because of its networking heritage, only the System Manager (the operator of the main console) can install or remove devices on the system, and regulate the user ID's and passwords. Virtual Systems will be releasing a networking edition of Quick Connect in the fall of 1988 that is compatible with Novell, 3COM, and other industry standard systems.

What really impressed me about Quick Connect was its ease of use, ease of installation, and its flexibility in controlling both the SunRiver and standard serial terminals within the same system.

Quick Connect/386 is available in two editions: the 5-user version has a list price of $595; the 16-user version has a list price of $995. It is available through authorized dealers and distributors.

VM/386 Multi-user From IGC

Like Quick Connect, VM/386 requires PC/MSDOS as the operating host, but its virtual machine architecture takes hold of your 386 computer and literally carves it into separate machines. Each machine is totally isolated from the next. It can have its own DOS, its own AUTOEXEC and CONFIG files, and memory resident programs. Any machine can be rebooted at will without affecting applications running in any other virtual machine. IGC's implementation of the virtual machine environment provides the highest degree of data integrity of all the operating systems in this report.

VM/386 uses the virtual-8086 mode of the 80386 to create a series of virtual machines.

I was quite impressed with the single-user, multi-tasking version of VM/386 when it was released earlier this year. This multi-user edition allows the execution of multiple copies of DOS across asynch and/or graphics workstations. The initial release version will support up to 8 users. It does not attempt to recreate or emulate the DOS environment. Instead, it executes the standard IBM or Microsoft DOS releases.

VM/386 uses the virtual-8086 mode of the 80386 to create a series of virtual machines. Each virtual machine behaves like a separate IBM PC/XT and thinks that it has exclusive access to all of the resources of the real 386 PC. You interact with the virtual machines in exactly the same way as you interact with a standard PC running MSDOS. Even ill-behaved applications that write directly to the screen run without modifications, except when async terminals such as the Wyse60, the Kimtron KT/7PC, or the IBM are used. Any combination of graphics terminals or asynch terminals can reside in the same multi-user cluster.

Setting up a VM/386 system is relatively straightforward. Place a copy of your VM/386 system disk into floppy drive A: and type CTRL-ALT-DEL. This starts an initialization process which copies information about your hardware from the BIOS and writes it to a file named VMINTS on the disk. Remove the disk and reboot the computer. Reinsert the VM/386 system disk in drive A: and log onto that drive. Type SETUP and answer the questions about your system. When this has been completed, VM/386 copies itself into a subdirectory, and sets up VM.BAT and CONFIG.VM files in the root directory, which are used by the program to set up the system's parameters when it is loaded.

When you run VM/386, you enter a "shell" environment which leads you into a series of submenus that allow you to customize your individual virtual machines. Here you can set up the size of each virtual machine, the processing power, time-slices and priorities, I/O ports, and the amount of conventional, extended or LIM expanded memory, and queues for communications ports to prevent data corruption when using a modem.

There are literally dozens of options that can be called into play to fine-tune the performance of each virtual machine. Help windows can be called up that explain what each option will perform. As you become more involved with the capabilities of VM/386, and the well-documented User Manual, you'll begin to appreciate the power of this program.

Utilizing this power will cost you 640K of memory which is set aside for the System Administrator. This means a 386 computer installed with 2MB of RAM will have less than 1400K in which to set up virtual machines. Virtual machines can be set up in 128K, 512K, and 640K sizes, so that you can allocate less memory for smaller applications. Depending on the type of display monitor used, video buffers will steal additional RAM from each virtual machine.

The System Resource Monitor automatically distributes CPU cycles to the active applications and temporarily suspends applications which are inactive. Initially, the criteria for suspending and reactivating virtual terminals

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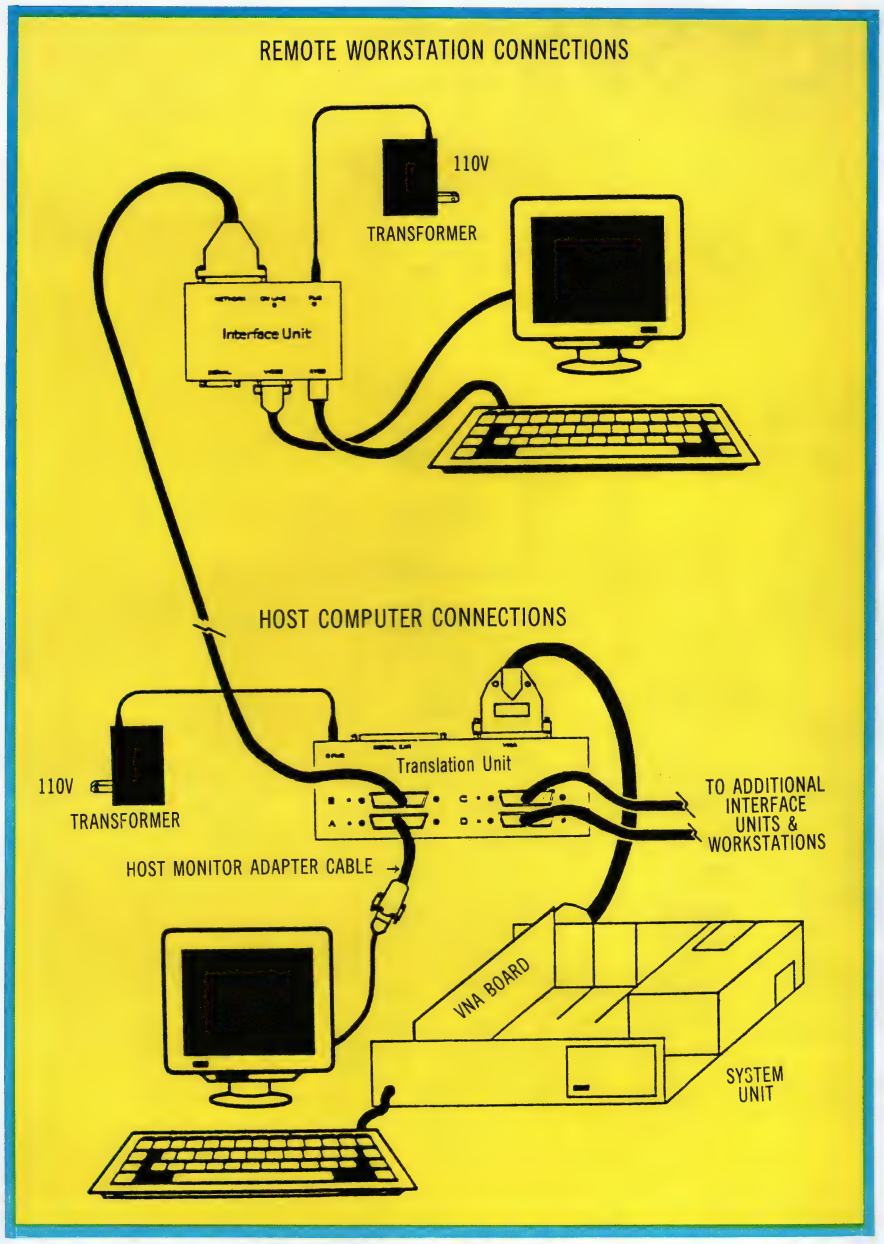

Illustration of how AMR's VNA components are connected for a multi-user system.

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can be configured by the System Administrator, but you can override any of these defaults if you have to.

After your virtual machines are created and written into the system, batch files can be constructed to automatically load any applications or system parameters. VM/386 Multi-User includes a built-in disk cache, the size of which can be configured from 0 bytes up to the amount of available memory. All of the virtual terminals can access the same hard disk, which doesn't need to be reformatted or repartitioned to accommodate VM/386. There is also a print spooler which will allow the applications to write directly to a virtual printer, which automatically creates intermediate spool files.

When VM/386 Multi-User runs on the host, it functions in the same way as the single-user edition. It will support multiple virtual machines on the main console. Asynch or graphics terminals can only support one virtual machine per station. I could not obtain information at this time whether multi-tasking will be implemented for terminals in a future edition. When a user is working on the host console, moving from one virtual machine to another is accomplished through a "hot-key." This can be either the SysRq key or the (Alt)SysRq keys, depending on how the keyboard scan codes have been implemented. Each time the switcher is activated, you move to the System Administrator, and select the virtual machine you would like to enter.

While VM/386 doesn't have the fluid switcher that Concurrent DOS uses (CTRL-1/2/3 or 4) to access a specific virtual console, there are reasons for going through the System Administrator. VM/386 is not a multi-user, multi-tasking operating system like CDOS. It is a control program that harnesses the resources of PC/MSDOS through its own operating environment. As such, it allows users to dynamically alter any virtual machine environment (whether on the host or the terminal), even if a program is running. This includes time-slicing, priorities, I/O port redirection, etc., with the exception of allocated memory.

The initial release of VM/386 Multi-User will appear on the Viewport Multi-User EGA and VGA hardware. Ports to the SunRiver workstations are in development. The final list price for VM/386 will be somewhere between $500-700. It is sold through authorized dealers and distributors.

Xenix/UNIX Multi-user Graphics Solutions

UNIX watchers are convinced that their operating environment will dominate the desktop computing market in the 1990s. They even predict that it will become more popular than OS/2. They reason that since they have an established base of users and mountains of application software (neither of which OS/2 has), they have a considerable edge in selling to the business market.

Considering how OS/2 has become the great "non-event," UNIX may very well become the dominant operating system of the 1990s. If it is to achieve this goal, it will have to increase its software base, and develop a much more simplified user interface. Setting up a UNIX system is akin to completing a thousand-piece jigsaw puzzle. The System Administrator of a multi-user UNIX installation has to be well-versed and knowledgeable. Interactive Systems has made a concerted effort to develop user "shells" and a menuing system for 386/ix. It should be emulated by other UNIX systems houses who still cling to AT&T's cryptic command structure.

UNIX watchers are convinced that their system will dominate by the 1990s.

UNIX has always been known as a programmer's operating system, which has an almost cult-like following. When it made its migratory path from the mainframe to the desktop, UNIX (like Concurrent DOS) was ahead of its time. Both operating systems could support multiple users and multi-tasking. Its strength lies in its modular architecture and its portability to different microprocessor environments.

Two things prevented these operating systems from achieving immediate popularity: desktop hardware didn't have the power and memory to support multi-tasking and multi-users successfully. So they moved into the vertical markets where they were customized for specific system requirements. This accounts for the large number of implementations that now exist.

UNIX system developers rely on AT&T for the source code of the operating system. Developers who support UNIX on the Motorola 68000 series of processors were up in arms recently over the joint development agreement AT&T entered into with Sun, a major producer of high-end engineering workstations. They felt Sun would have a significant edge in getting to market enhanced versions of the operating system months before they could. As a result, they have banded together and formed the Open Software Forum (OSF) in an attempt to create a universal standard for the binary code and simplify the portability across different hardware platforms.

A movement toward standardizing the UNIX binary code for 80386 processor is also under way. A recent agreement between Microsoft and AT&T, a standard porting base is about to be released for the 80386 processor. The porting base is being created by combining Xenix 386 System V Release 2.2 and UNIX System V/386. AT&T, Microsoft, SCO, and Interactive Systems are collaborating on the development of the merged product.

It is being considered an upgrade, one that will enable UNIX vendors to build systems that provide backward and forward UNIX/Xenix binary compatibility and 386 optimization. The new operating system base will support both AT&T's Common Object File Format (COFF) and Intel's Object Module Format (OMF) binary code (all MSDOS, PC DOS, OS/2, and Xenix systems use OMF). What this will not do, though, is create a situation where all UNIX products will be equal. Value added implementations will still be the prevailing rule.

While UNIX developers struggle with the future, it's business as usual. Customers need product support, and they need to be able to incorporate the latest hardware technology into their systems. Since multi-user solutions under UNIX are built around the same multiport serial I/O hardware and the same serial terminals as DOS compatible operating systems, it wasn't unexpected to find UNIX and Xenix developers jumping at the opportunity to write drivers for the SunRiver, Advance Micro Research, and Viewport multi-user graphics hardware.

UNIX developers compete with the DOS market on the Intel 80386 processor. It therefore behooves them to support enhanced hardware platforms if they are to maintain their position. While there may be any number of UNIX developers working on multi-user graphics solutions, the only vendors I was able to locate were the Santa Cruz Operation and Interactive Systems. Locus Computing informed me that they are currently evaluating the market potential for multi-user graphics and testing the hardware platforms. It's possible they may become a major participant in this market in 1989.

Xenix 386 System V From The Santa Cruz Operation

The original Xenix implementation was done by Microsoft in the early 1980s, when Microsoft licensed the UNIX source code from AT&T for the development of its own Xenix System for PDP-11 computers. Realizing the potential the Xenix System had in turning personal computers into multi-user business systems, The Santa Cruz Operation licensed the Xenix source code from Microsoft, and developed the original port of Xenix to the 8088-based IBM-PC in 1983. SCO became Microsoft's second source for Xenix, as well as co-developer and sole distributor of the unbundled packaged Xenix product.

Xenix is a full implementation of UNIX. The reason for the name change had to do with a prior AT&T trademark restriction; otherwise the product could have legitimately been called Microsoft UNIX, or even SCO UNIX.

The SCO Xenix Driver for the Sun-

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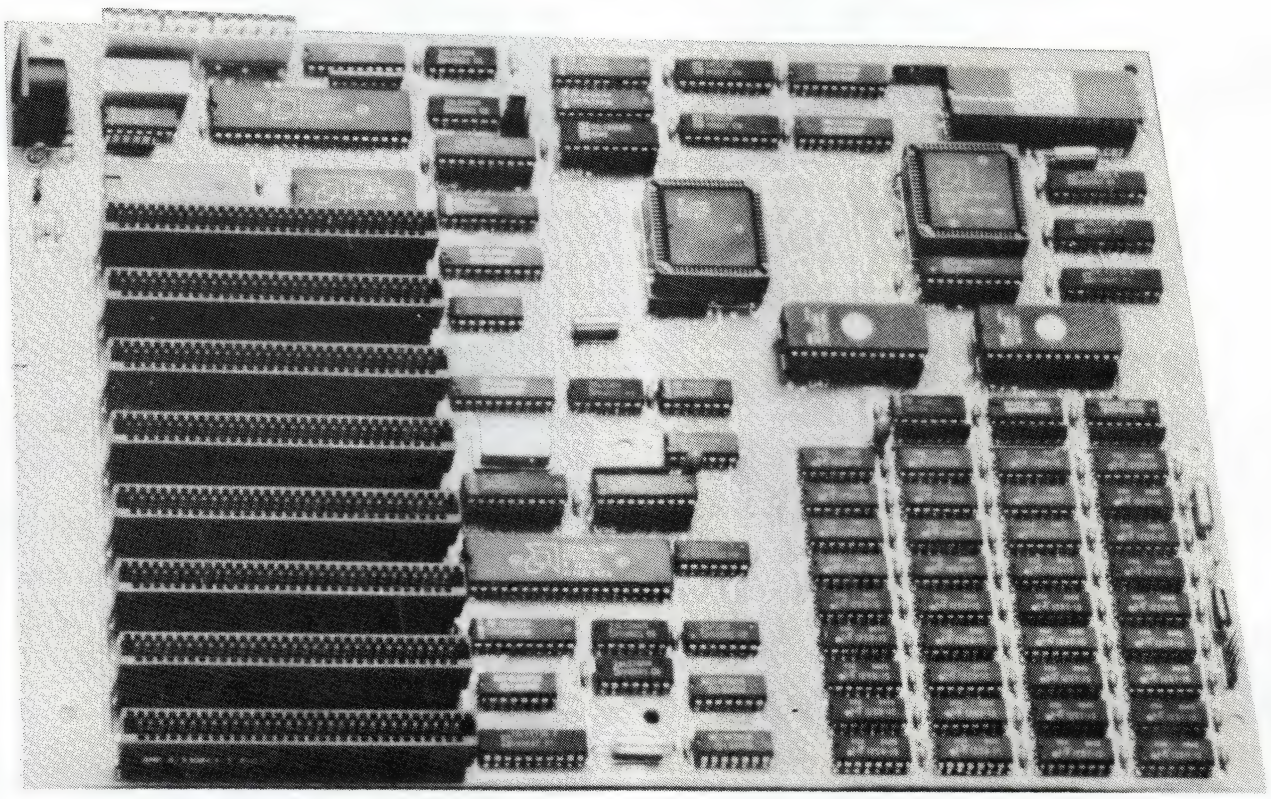

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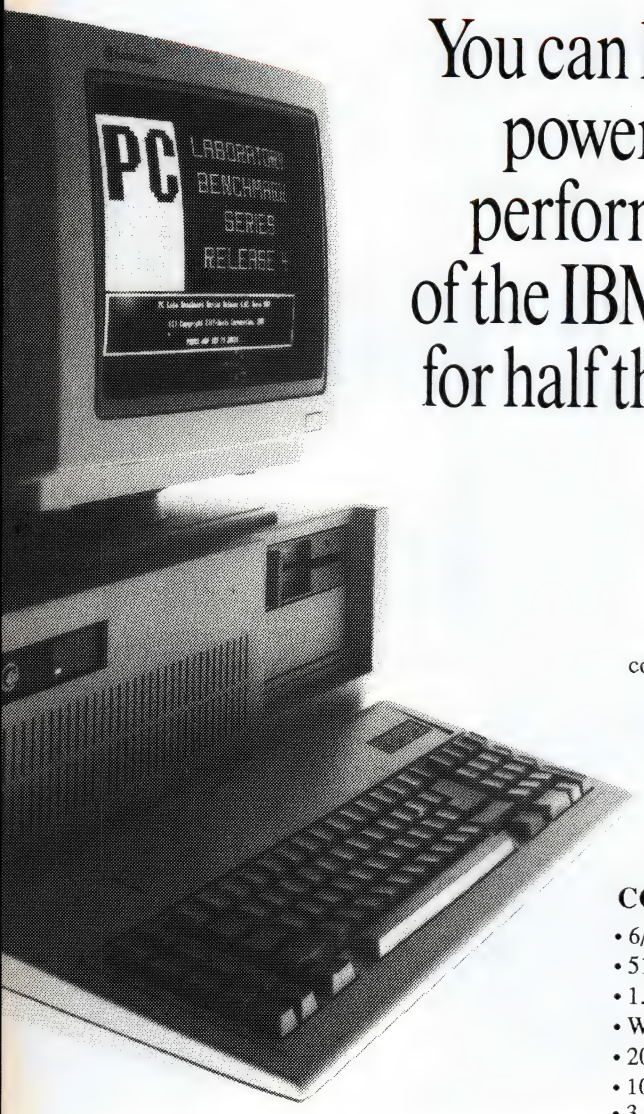

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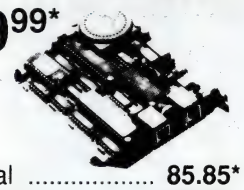

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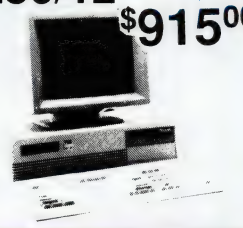

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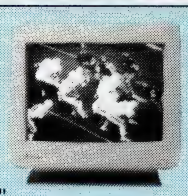

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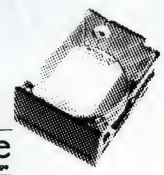

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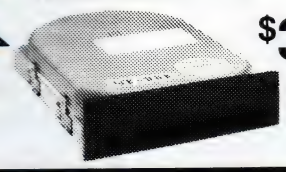

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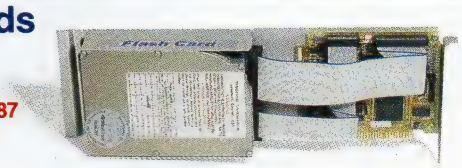

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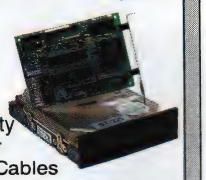

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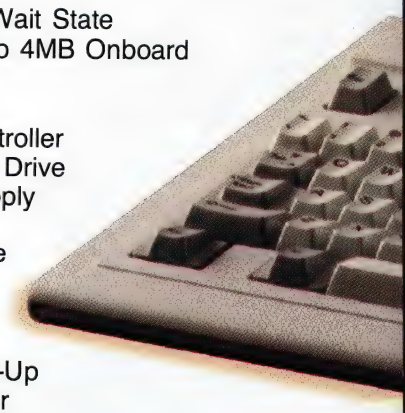

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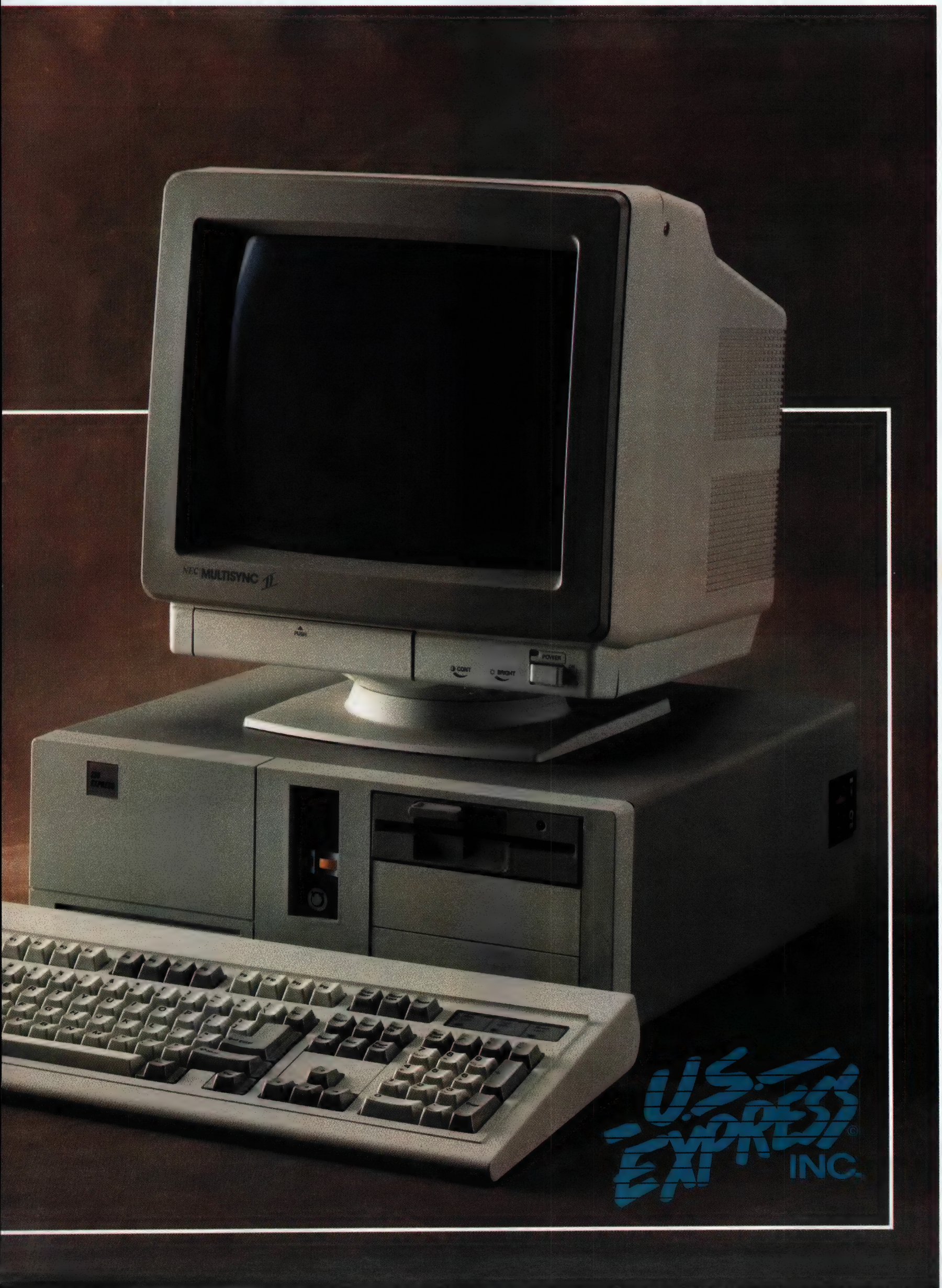
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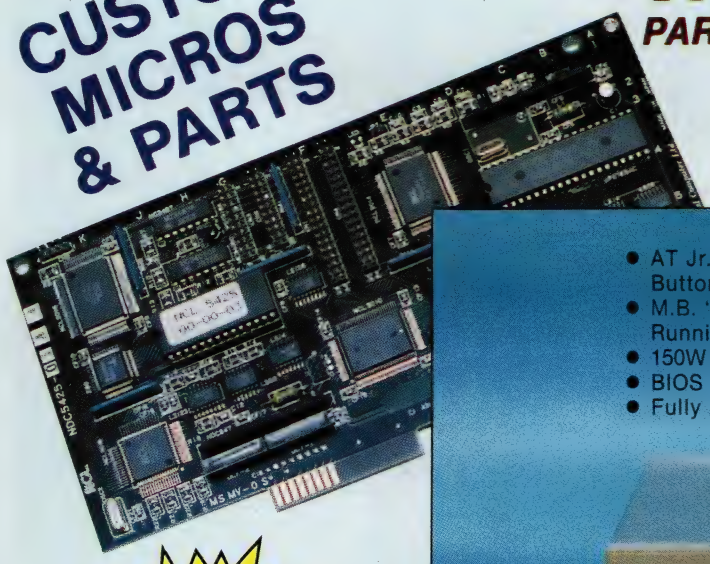

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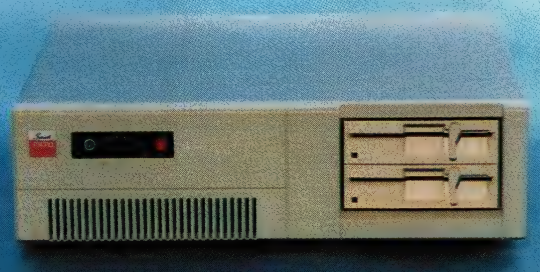

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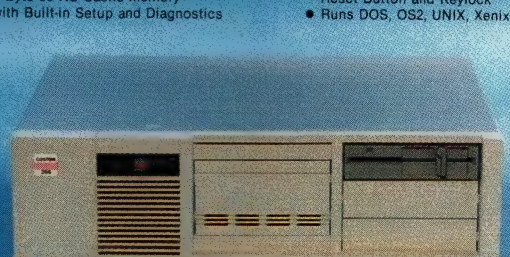

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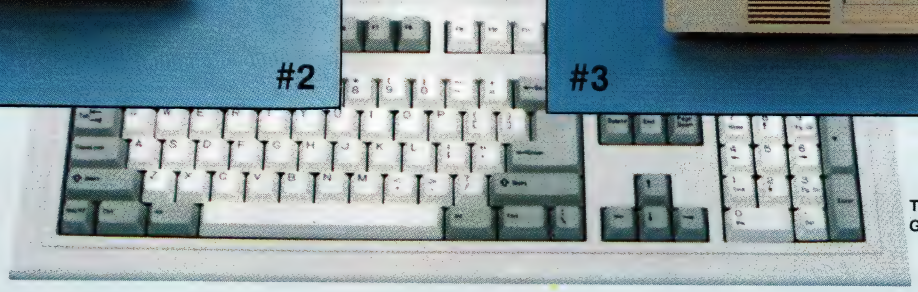

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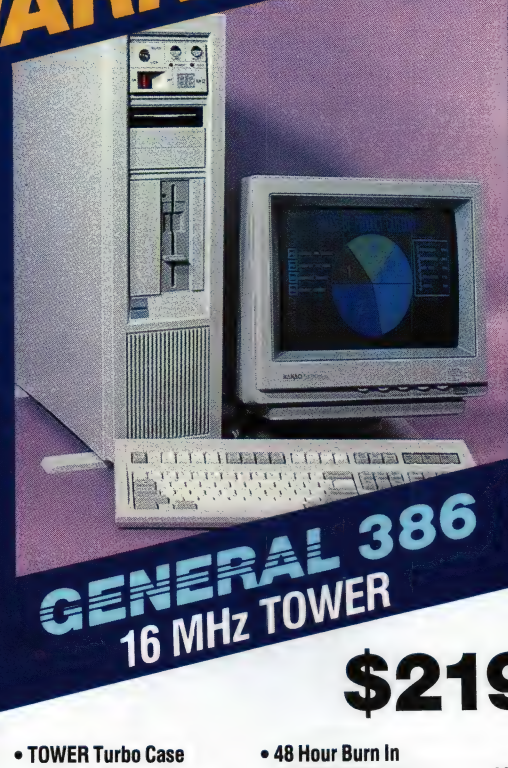

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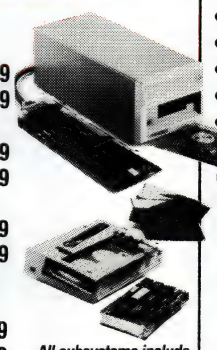

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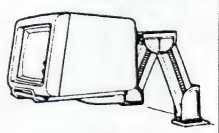

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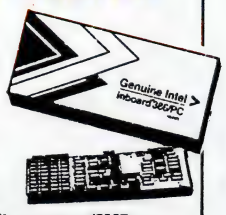

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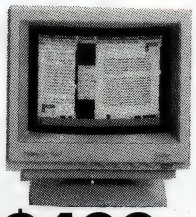

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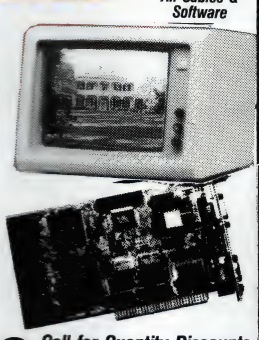

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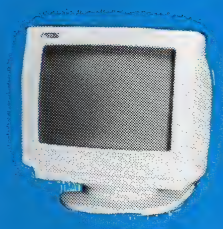

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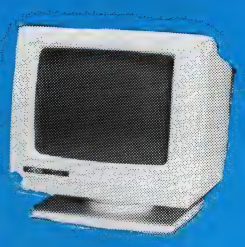

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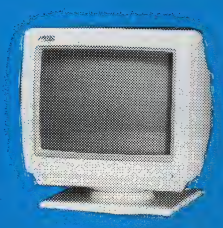

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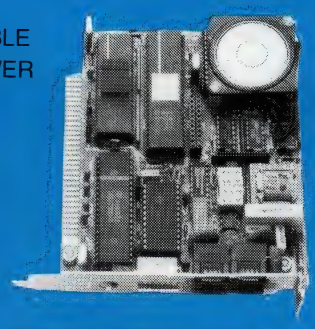

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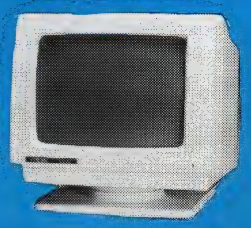

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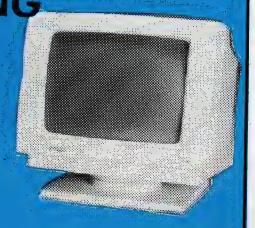

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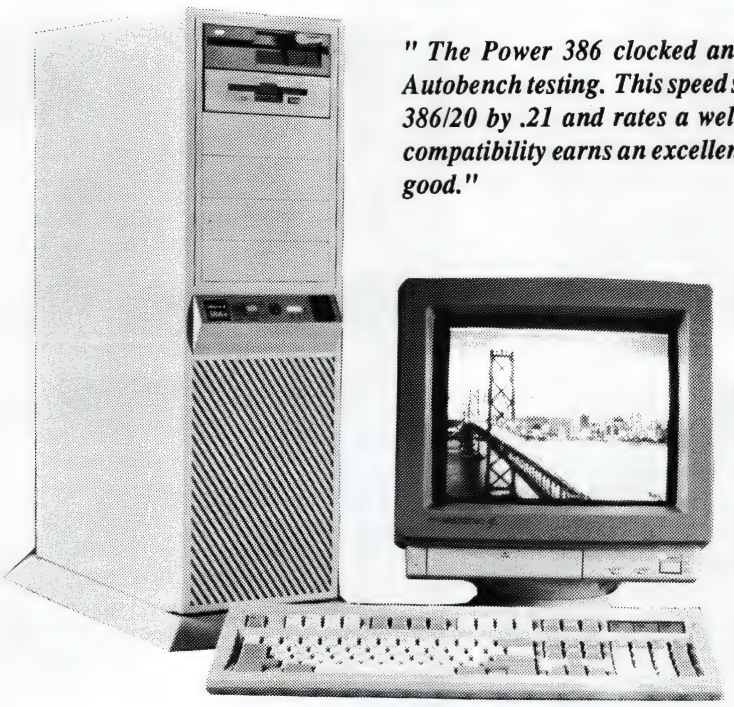

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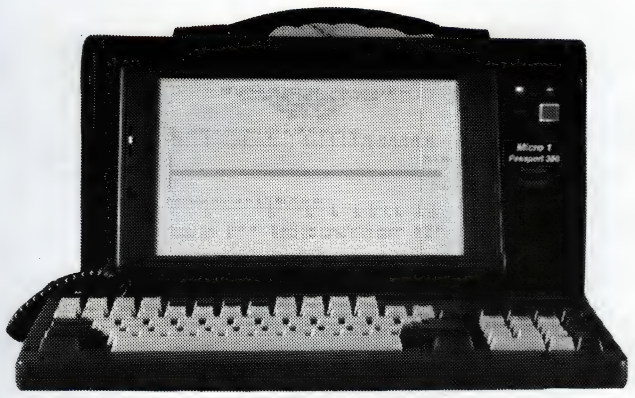

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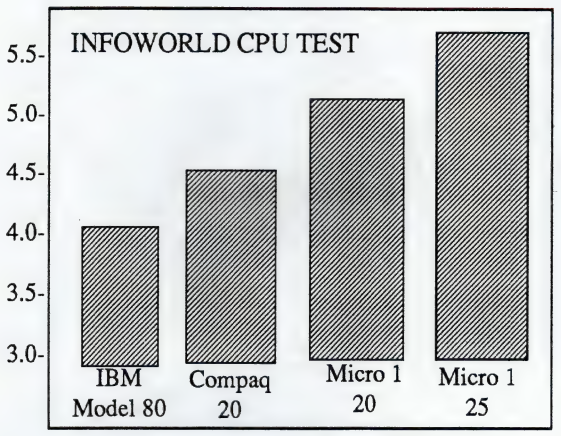

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InfoWorld • May 2, 1988

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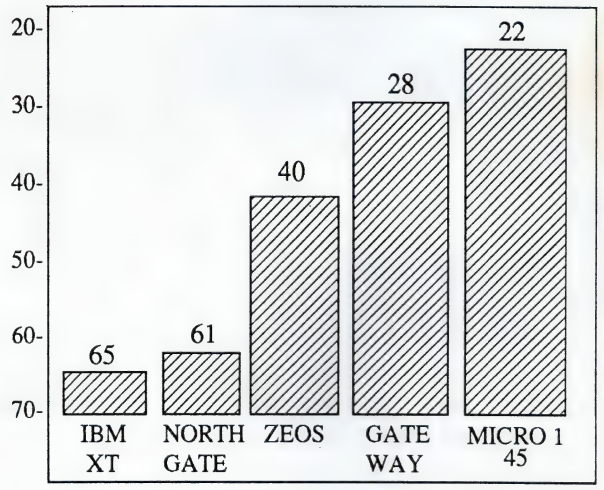

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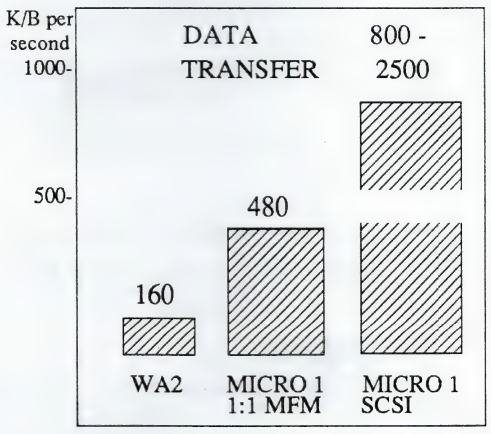

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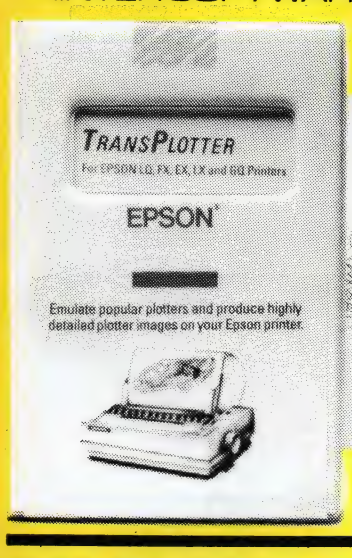
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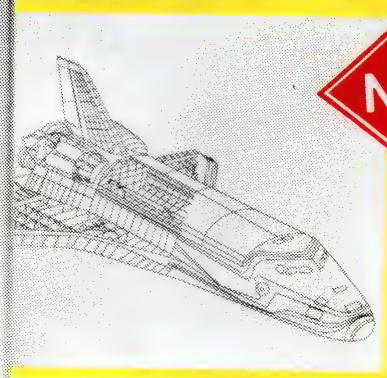

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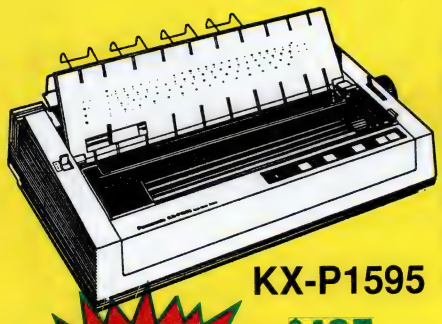

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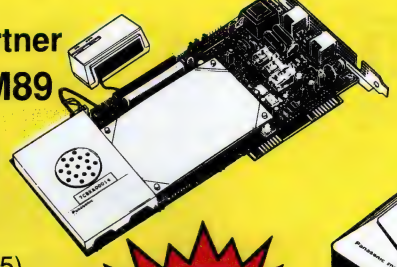

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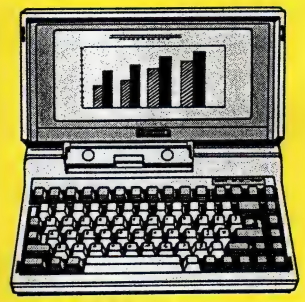

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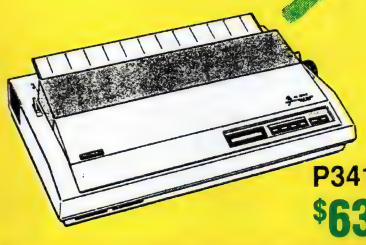

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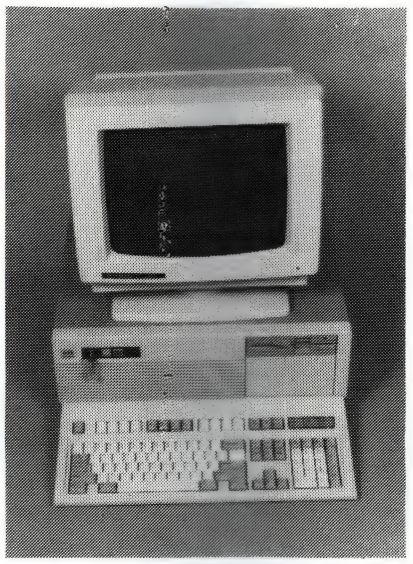

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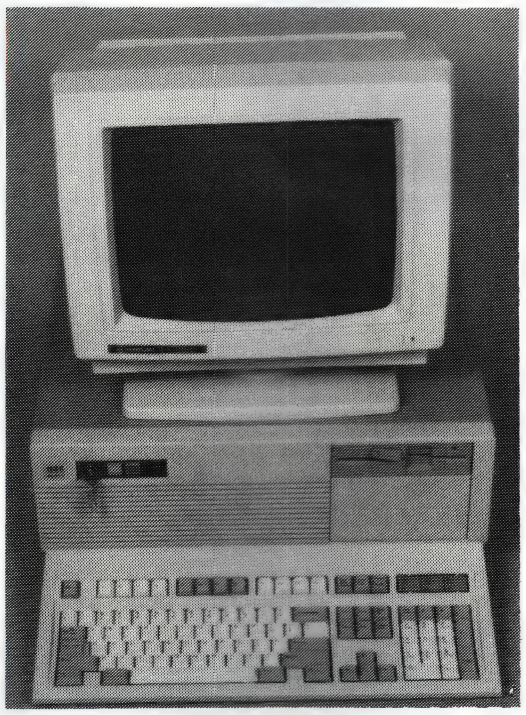

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Laser Partner 1599
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Multi-User
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River Fiber Optic Stations arrived just as I was getting ready to tackle the final leg of this report. This driver provides support for SCO Xenix 386 Release 2.2.2 or 2.2.3. A maximum of four host adapters are supported. There is no VP/ix support at this time and the driver will not operate properly when VP/ix is installed. VP/ix, developed by Phoenix Technologies and Interactive Systems, will allow you to install MSDOS under various UNIX implementations and run multiple DOS applications.

Installing the SunRiver driver under Xenix is less complicated than I thought it would be, but it does get somewhat involved. Login as the super user by typing "root," and enter the appropriate password as necessary. Then type "etc/custom." When the custom menu appears, select 4 to indicate that you want to add a supported product. Custom will read the disk and present a menu of eight selections. Select "1" and then "ss" to install the SunRiver driver.

You now insert the driver disk into the floppy drive. Custom will read all files from the disk and execute the SunRiver installation script. If the link kit hasn't been installed, you have an opportunity to install it. The SunRiver installation script requires that the link kit be installed. Script will print several messages indicating that it is adding device entry points, adding the SunRiver driver to the link line, and re-linking the kernel.

Once the kernel has been re-linked, you'll receive a message that /xenix has been backed up as /xenix.old and that the new kernel has been moved to /xenix. Exit custom, remove the driver disk and reboot the system by typing "sync" [return] and "/etc/reboot" [return].

During the system reboot, a screen message will show the physical address where the SunRiver host adapter cards were found, the number of SunRiver channels found by the driver, the number of Multiscreens allocated, and the amount of physical memory allocated for the Multiscreens. At this point, you login again as the super user, and then use the "enable" command to enable login prompts on the desired SunRiver stations according to a chart that has been provided.

Xenix will support up to 4 SunRiver host adapters, for a total of 16 users. Three Multiscreens can be allocated for each user, but you may wish to limit this number based on the amount of memory you have. Both serial ports and the parallel port on each SunRiver station have to be enabled before they can be used for mice, drawing tablets, printers, plotters, and so forth. This aspect of the installation procedure uses a series of major and minor numbers for naming conventions which are automatically determined by the installation script.

The immediate benefit the SunRiver stations provide for a Xenix system is that such graphics oriented programs as SCO Imagebuilder (a chart-making and drawing program), and CAD/CAM applications, can now be used by multiple users. The same applies to a new document processing (desktop publishing) program that is due to be released shortly. With the addition of SCO's versatile word processor, Lyrix, users now have an entry to the kind of graphics and document processing that the DOS world has had for some time under GEM and Windows environments.

Although the variety of bit-mapped graphics applications under Xenix are still limited, the arrival of multi-user graphics hardware may spur the development of applications that can run under the X Window environment. This would have to include programs that can manipulate images generated by scanners.

Xenix will support up to 4 SunRiver host adapters for a total of 16 users.

The SCO Xenix operating system is delivered in a three-volume edition that includes the Run Time Environment, the User's Guide, and the Configuration Guide. It has a list price of $695 for 386 computers. The SunRiver driver is available as a separate product for a nominal cost. Drivers for the AMR Video Network Adapter weren't quite finished by my editorial deadline, but they would be supporting the Monochrome and the VGA hardware platforms.

386/ix And VP/ix From Interactive Systems

Unlike the DOS operating systems market in which there is no cooperative environment among developers (since Microsoft and IBM have claimed squatters rights), the UNIX market, notwithstanding the current squabble over source code distribution, seems more inclined toward cooperating for the purpose of advancing the operating system.

One of these key developers is Interactive Systems. Although Intel contracted AT&T to port UNIX to the 386, AT&T contracted the actual work to Interactive Systems. When the port was finished and the source code licensed to the UNIX development market, Interactive released an enhanced version called 386/ix. When combined with the UNIX Software Development System, it delivers the standard functionality of AT&T's UNIX V.3.

The cross licensing can get hectic at times. Interactive, for instance, developed VP/ix in collaboration with Phoenix Technologies, the leading purveyor of PC compatible ROM BIOSes. VP/ix facilities enable you to run DOS under UNIX. It contains a customized version of MSDOS that provides some multi-user and multi-tasking functions to DOS when installed in a UNIX system. VP/ix was also licensed to SCO.

The chief benefit of running DOS under VP/ix in a 386/ix system using the SunRiver platform is that you have access to a large base of desktop publishing and graphics programs. Text files from 386/ix can be moved into DOS for document processing. Database files can be exported to a DOS chart-making program. Plus, you have access to a large library of bit-mapped illustrations to incorporate into your documents. There may be less reliance in the future on this merging of two operating environments when similar applications begin appearing under X Windows. However, as X Windows has been around for some years and is only just now attracting the attention of UNIX developers, it may be some time before the quality of graphics applications is comparable to those available under DOS.

JSB Computer Systems, one of the UK's leading UNIX system software developers, worked to integrate 386 UNIX and DOS applications under a single windowing system. The new product, called 386/ix MultiView, will allow existing DOS textual applications to run in windows alongside existing UNIX applications on both character and graphics terminals, and will integrate data transfers between them via a cut-and-paste facility. It is also available as SCO MultiView.

386/ix support for the SunRiver stations is limited to two host adapters, which means eight terminals. Four virtual terminals can be activated each station. The basic installation concept is similar to SCO XENIX, except that the syntax between these two versions isn't exactly the same. While the SCO versions requires you to enter commands from the system prompt, Interactive's hallmark for providing user-friendly interfaces provides readers with a series of menus from which appropriate actions are selected.

As the groundswell begins to climax in the months ahead, more people will begin to ask: O/S who?

The SunRiver stations can reside on a 386/ix system with conventional serial terminals in small multi-user systems. The actual number will depend on how many users the system can support and the usual variables. If it is necessary to run numerous graphics-based applications, particularly in a CAD/CAM environment, clusters of SunRiver terminals might be used to their best advantage if they are the only terminals connected to the main console. Such a cluster can then be integrated into the Interactive and MICOM-InterLAN environment for large 386/ix systems.

With the joint development of real-time extensions for 386/ix by Interactive and VenturCom, SunRiver terminals can also be used to display interactive graphic displays in process control situations.

The SunRiver driver has been incorporated into release version 1.0.5, which is priced at $645. This version includes the VP/ix and the Ten-User Interface. This interface allows you to use keyboard function keys to execute many system commands. The SunRiver driver is usable with VP/ix. The SunRiver driver is available separately, but I was unable to obtain a price. The AMR port was still in development, so I was unable to perform a system check of this operating system and hardware environment.

The Final Word

If you find yourself slightly bewildered by all the hardware and software product alternatives in this report, I assure you that you're not alone. Keeping them in some kind of perspective wasn't all in a day's work. Some of the solutions offer greater versatility than others; but what is important to remember, is that they all work within the context of their environment.

Considering the technological bridges these products have crossed, future release versions should equalize the alternative solutions and add new features. Viewed as a group, these multi-user graphics solutions are rather impressive, and I venture to predict that they will have an incredible impact on the way desktop publishing and CAD/CAM operations are accomplished over the next few years.

As I worked with these products, one annoying fact kept surfacing. It had to do with the inadequacy of the current generation of 386 computers. While the 16MB memory limit may have been sufficient a year ago for multi-user systems using serial terminals, they have become a stumbling block to such operating systems like Concurrent DOS 386 MGE and UNIX, because they support multi-tasking on the SunRiver Fiber Optic Stations.

I think the time is ripe for a new generation of 386 motherboards that increase the number of expansion slots and decode additional address lines so that machines can be built with 32MB of RAM. You cannot realistically expect existing 386 computers to host more than 8 stations, plus multi-tasking, without running out of memory.

Perhaps the arrival of these powerful operating systems and multi-user graphics engines will encourage the development of motherboards that can harness this potential. I'm not talking about new technology. Chip-sets from several manufacturers already exist that allow the building 386 motherboards using only 8 or 10 major gate array devices. Implementing additional address lines is not a monumental feat. Several board makers I spoke with recently indicated that this would be a relatively minor engineering project, and that adding the type of memory I advocated can be accomplished quite easily when 1MB and 4MB RAMs are

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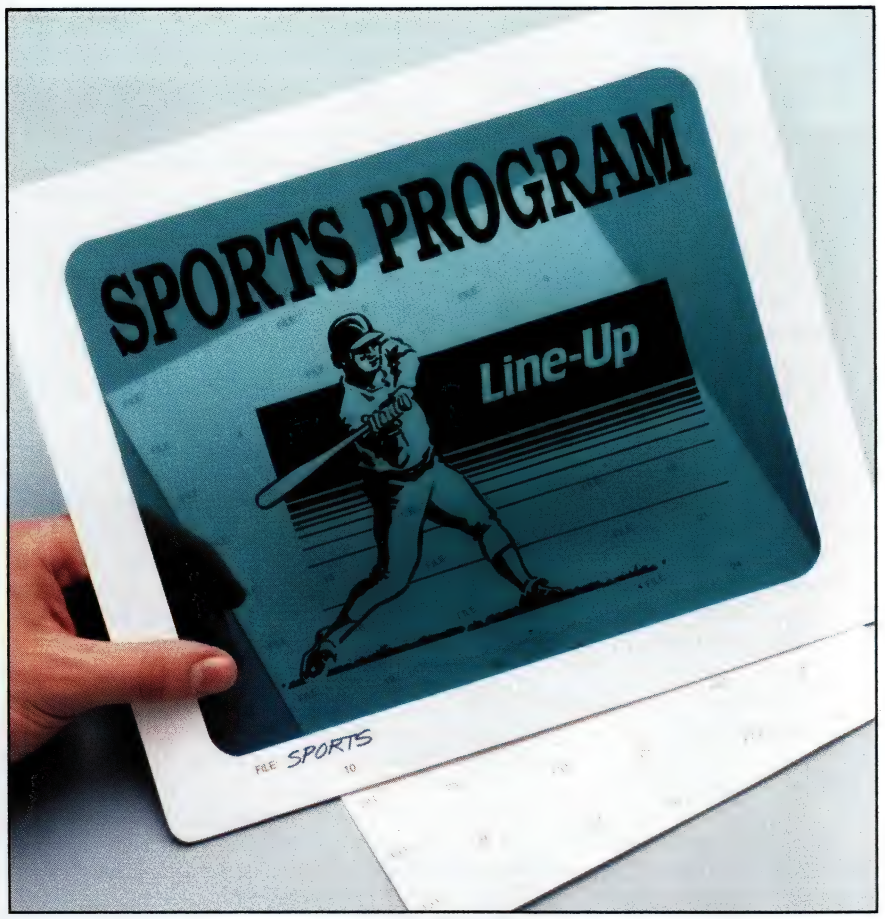

Arkwright Overhead Transparency film for laser printers.

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allows network users to exchange mail, files, phone messages and appointment schedules. The product combines the programs of Word Perfect Library—Notebook, calendar, file manager, Macro and Program Editors, Calculator and Shell—with electronic mail and scheduling programs. Each workstation running Word Perfect Office 2.0 requires 384K and DOS 3.0 or higher.

At least 512K is recommended for each workstation using Word Perfect 5.0. The suggested retail price for PC networks is $495 for the file server and $150 for each additional station.

Word Perfect 4.2 for SCO Xenix is Word Perfect's first software package for Intel 80386-based machines. The Xenix version of Word Perfect was ported specifically for the 80386, allowing it to take full advantage of the microprocessor's 32-bit architecture.

The SCO Xenix version of Word Perfect 4.2 is identical to the PC 4.2 single user version and supports a wide range of terminals and printers. 4.2 includes up to 24 snaking or parallel on-screen columns, table of authorities, line numbering, a rectangular block/move feature and a document comments/summary feature.

Word Perfect 4.2 for 80386-based machines runs SCO Xenix System V, Release 2.2.2 from The Santa Cruz Operation. The product has a suggested list price of $995. For additional information see both products at Booth #4024.

Monitors...Low Cost To High Resolution
Goldstar Technology 1210A And 1220W Monitors

Goldstar will be showing a two new 12 inch monochrome monitor.

The 1210A is an economical 12 inch monochrome monitor with high visibility (720x350) and amber display. It has a suggested retail price of $129.

The 1220W is a new VGA, 12 inch, paper white, analog monochrome monitor. It has a suggested retail price of $199. See both models at Booth #H7462.

Ventek Corporation New 2000 Series Graphic Display Subsystems

Ventek will be displaying two new graphic display subsystems that feature 20" screens. The AT 2000 is an AT bus compatible ultra-high 1280x1024 resolution in addition to full IBM VGA compatibility, including gray scale modes. The suggested list price is $2695 and includes an AT bus adaptor card, necessary software utilities and drivers.

The PS 2000 has the same resolution as the AT 2000 with complete PS/2 VGA compatibility. For pricing and additional information on both products stop by the Xerox Booth.

Storage, Controllers And I/O Cards... Beef Up Your PC
Boca Research BOCARAM.MCA 50z And BOCARAM/AT

Boca Research will display two new memory expansion boards, the BOCARAM/AT for the AT bus and a PS/2 board called the BOCARAM.MCA 50z.

The BOCARAM.MCA 50z is designed to be 100% IBM Micro Channel compatible. The board offers both extended (OS/2) memory and expanded (LIM/EMS 4.0) memory with a maximum of 2MB per board for the IBM PS/2 Models 50, 50z and 60. The 50z has a suggested list price of $245.

The BOCARAM/AT Plus functions at any CPU speed but is designed for higher speed ATs. Each board offers up to 8MB of expanded or extended memory. The suggested list price is $225. See both products at the Boca Research Booth #R8326, in the Riviera Hotel.

Computer Peripherals PS/M8

Computer Peripherals will introduce a new memory expansion board called the PS/M8. The PS/M8 is an add-in circuit board that fits into a Micro Channel expansion slot and increases the internal memory of IBM PS/2 Models 50, 60 and 80 by 8MB. The PS/M8 has a suggested list price of $499. See it at Booth #R8326.

Dastra America 16-Port UNIX Card

Dastra America will have their new 16-port UNIX card to demonstrate. The MCIO/16 is for IBM PC/XT and AT bus machines.

The card features default firmware specially designed for the needs of SCO Xenix, UNIX and other multi-user operating systems. It supports standard asynchronous line protocols, all compatible with RS-232C standards and common line speeds from 50bps to 34,400bps. The MCIO/16 is also available as an 8 port device for $1095. The 16 port version has a list price of $1495. See both models at COMDEX/Fall Booth #A664.

Distributed Processing Technology Caching Disk Controller

Distributed Processing will display their new PM3011 intelligent, caching, hard disk controller. It can produce

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Multi-User
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produced with greater production yields and lower prices.

I also surveyed a number of large corporations to determine what kind of interest they would have in multi-user graphics workstations. Many were surprised and interested that this technology was about to be realized for the DOS and UNIX environments. Others had heard about the multi-user graphics solutions from their suppliers and VARs and have been waiting to take delivery of these systems.

As this groundswell begins to climax in the months ahead, more people will begin to ask, "OS/Who?"

For additional product information and a list of authorized resellers of multi-user graphics operating systems and hardware, please contact the participating vendors listed. Most of these vendors have been running seminars at their headquarters for VARs and major corporations. They have also been sending product management teams to regional seminars and industry trade shows. Write for a calendar of these events if you wish to attend.

Advanced Micro Research
One Lagoon Drive
Redwood City, CA 94065
415-594-9991

Concurrent Controls, Inc.
925 Linden Ave.
S. San Francisco, CA 94080
415-873-6240

Digital Research
Box DRI
60 Garden Court
Monterey, CA 93942
800-443-4200/408-649-3896

Product Relationships

Hardware	Software
Sun River	* { Concurrent DOS 386 MGE (DRI)
	* { 386/ix (Interactive Systems)
	* { Quick Connect (Virtual Systems)
	* { SCO Xenix 386 System V (Santa Cruz Operation.)
	* { PC-MOS/386 (The Software Link)
Viewport Technology	* { SmartScreen 386 (CCI)
	* { VM/386 Multi-User(IGC)
	* { OEM VM/386 (Viewport Tech.)
	* { PC-MOS/386 (The Software Link)
	* { SCO XENIX 386 System V (Santa Cruz Operation.)
Advanced Micro Research	* { 386/ix (Interactive Systems)
	* { PC-MOS/386 (Software Link)

* = drivers and/or ports completed
\# = in development; approx release, Fall 1988

Intelligent Graphics Corp. (IGC)
4800 Great America Pkwy
Santa Clara, CA 95054
800-458-9108/408-986-8373

Interactive Systems Corp.
2401 Colorado Ave.
Santa Monica, CA 90404
800-648-7002/213-453-8649

The Santa Cruz Operation
P. O. Box 1900
400 Encinal St.
Santa Cruz, CA 95061
40{'-425-7222

Th> Software Link
3577 Parkway Lane
Norcross, GA 30092
800-451-5465

SunRiver Corp.
P. O. Box 9367
Jackson, MS 39213
601-957-0100

Viewport Technology, Inc.
4800 Great America Pkwy/Suite 410
Santa Clara, CA 95054
408-748-1495

Virtual Systems
1500 Newell Ave., Suite 406
Walnut Creek, CA 94596
415-935-4944 ●

COMDEX '88 Preview
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typical disk access times on PC AT-class machines of 0.5ms. The PM3011 contains a variable-size RAM cache and an on-board Motorola 68000 microprocessor. The additional processor allows the AT to transparently read from and write to the controller cache while the DPT board simultaneously accesses the physical disk. For additional information see the complete DPT line at their East Hall Booths 109 & 111.

Western Dynex Removable Datamodule Winchester Disk Drives

Western Dynex will show two new Datamodules for IBM PC, XT, AT, PS/2 and 80386 computers. The DN2000G40 and DM2000G100 are small, attractive, removable, Winchester disk drives with on-board SCSI controllers.

The Datamodules have formatted capacities of 40 and 100MB, 25ms access times, data rates of 10 + Mbits/sec, self-parking heads and the ability to withstand more than 75gs of shock. For additional information and pricing see the Western Dynex Booth.

Maynard Electronics New Maynstream 150 And Maynstream 2200HS

Both the 150 and 2200HS will be demonstrated. The Maynstream 150 is the first high-performance internal tape backup system designed for all PS/2 products. The 150 is a 150MB, 3.5" cassette type tape backup system. A portable model might also be displayed. Both models of the Maynstream will range in price from $1600 to $2000.

The Maynstream 2200HS is a 2.2 gigabyte tape backup system. This portable, high capacity system uses helical scan technology to increase the capacity of a single, 8mm digital data cassette with Maynstream software.

The 2200HS for the IBM XT, AT, 386s, and PS/2 Models 25 and 30 has a list price of $6995. The 2200HS for PS/2 Models 50, 60, 70 and 80 has a list price of $7095. Both the 150 and 2200HS will be displayed in the Maynstream Booth #1202 & 1208.

Procom Technology New NetMaster And PhD Series Of High Speed, High-Capacity Hard Disk Drives

Procomm will show both a 145MB and 330MB Netmaster Series Drives. They feature a high performance ESDI interface with an 18ms access time and 100% IBM, DOS, OS/2, SCO Xenix, AIX, Novell and 3Com compatibility. Each drive has full Comprehensive Surface Analysis (CompSurf) before being shipped. The 1:1 interleave, 10Mbit transfer rate drives are guaranteed to be 100% network compatible.

The NetMaster/PS (145MB) is $2495, the (330MB) has a list price of $4295. For AT-class machines and compatibles (286 & 386) the NetMaster/PC (145MB) lists at $2495 and the (330MB) $4295.

Procom will also be displaying a line of 100% IBM compatible, high capacity, ESDI hard disk drives for PS/2 models 60, 80 and AT class machines. The PhD-E and PhD-E/PC series of hard disk drives feature 1:1 interleave and average access times of 18ms. The PhD series is designed for the IBM PS/2

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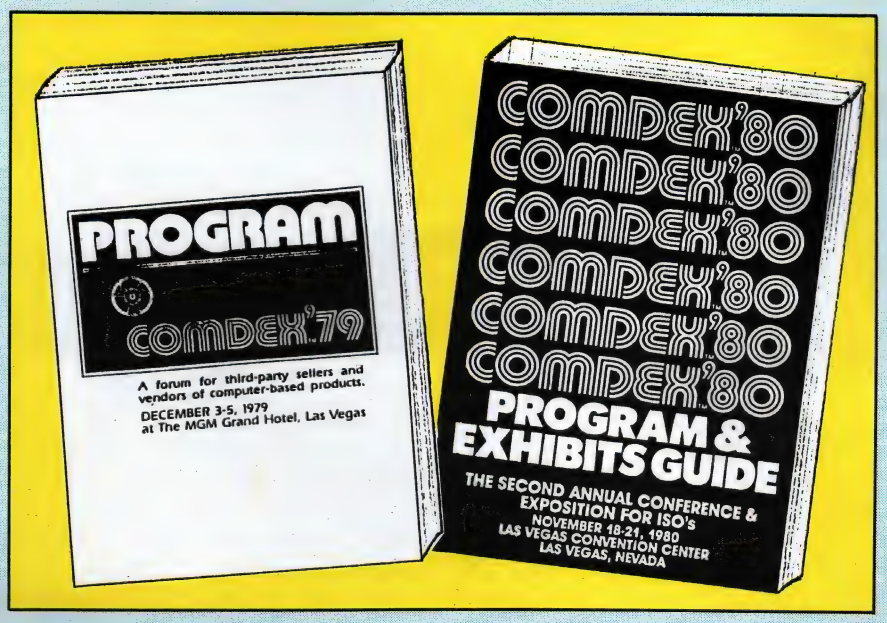
New Lattice C Compiler Version 3.30 with Bind Utility and API Library.

The First Comdex
continued from page 12

and Opportunity." A prophetic statement for the industry if not for the ISOs. The keynote speeches were delivered by Irwin Jacobs of Digital Equipment Corp.; Dennis Kagan of DJC (a large distributor); Bob Diamond, Publisher of *Infosystems* Magazine; Dick Brown, president of The Computer Store and Bob Rodgers of The Compushop.

The program of seminars was almost completely directed towards sellers of computer equipment and attempted to guide the attendees along "The Profit Path In Computer Retailing." This typical theme was expressive of the first Comdex and since it addressed the needs of the ISOs the show was a success.



COMDEX 1979 and 1980 Program Guides.

What was the industry like in 1979 and who exhibited at that first Comdex? The 8080, Z80 and 6800 were the principal CPUs. Such computer manufacturers as Altos, Digital Microsystems, DEC, Dynabyte, IBC/Integrated Business Systems, Micro V, Ohio Scientific, Onyx Systems, Pertec Computer Corporation, Quantel, Rexon, Scientific Data Systems, Tano and Vector Graphic were exhibitors. Except for the larger minicomputer companies, most of these names are forgotten, or are dim memories today. Missing were the larger personal computer manufacturers like Apple, Radio Shack, Cromemco, Commodore, Northstar and Atari. They either did not see themselves in the world of ISOs or were waiting to see if this show was going to make it.

The Unforgettable 1980 Comdex

What a difference a year made in Comdex! The 1980 show moved from the MGM Grand to the Las Vegas Convention Center where it occupied 150,000 sq. feet in the North and South Exhibit halls. Conference sessions were held in the Las Vegas Hilton as well as the Convention Center. Some 400 exhibitors filled 750 booth units and the most important industry leaders were either attending or exhibiting.

The explosion in the size of the show was what saved Comdex and a good part of the personal computer industry. This is not merely my opinion, but cold hard fact for this was the year of the terrible fire in the MGM Grand Hotel. If Comdex had not outgrown the Grand and became forced to move to the Convention Center, the show and many industry lives might have become lost in the fire. As it was, at least eight exhibitor's personnel were among the 90 lives lost in the fire.

The fire actually took place on the last day of the show and although it cast a pall on the activities Comdex 1980 was a great success.

The keynote speaker was Federico Faggin, president of Zilog (maker of the Z80 CPU). The subject was "ISOs and Vendors, together we'll make it happen." The subject was timely because by 1980, which was a recession year, the first industry shake-out of computer stores and independent sales organizations was occurring. It was also obvious that to succeed in selling the microcomputer to businesses, more reliable systems were needed.

Many leading manufacturers had by

continued on page 170

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EGA	$1089	$1164	$1358	$1384	$1501

NEC P2200 Printer

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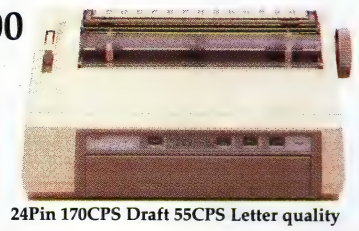

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Mono	$1381	$1485	$1594	$1725
EGA	$1775	$1879	$1988	$2119
VGA	$1946	$2050	$2159	$2290

PC BRAND 286/20 $1400

20 MHz Clock, Zero Wait Operation Norton SI 20.4 •Landmark™ Speed 25.9MHz

512K, 1.2MB or 1.44MB Drive, 101-Keyboard

Standard System Features:

- 80286 Processor Operating at 20MHz with Zero Wait States in interleave mode delivering 26MHz Effective Throughput
- 512K RAM expandable to 8MB on the System board using 256K and/or 1MB 100ns RAM chips (4MB on motherboard and 4MB on optional special interleaving daughter card)
- 1.2MB 5.25" or 1.44MB 3.5" Diskette Drive
- High Performance Dual Hard Drive/Floppy Drive controller
- Enhanced 101-key AT Style Keyboard
- High Capacity 200 Watt System Power Supply
- Real Time Clock/Calendar with 5 Year Battery
- 80287 Co-Processor Support
- Industry Standard BIOS with full MS/DOS, OS/2, XENIX, NOVELL, 3COM, and PCNET compatibility
- Built-in System Board LIM 4.0 EMS hardware drivers
- User configurable I/O timing permitting compatible operation with older peripherals or faster I/O for newer devices
- 8 Slot motherboard design (6 16Bit & 2 8Bit)
- Medium foot print case with 5 Disk Drive bays

Options:

- Tower Case • 4MB Interleaving Ram Card
- Custom configurations w/Name Brand peripherals of your choice
- Compaq® Style LCD Portable • Factory Installed RAM Upgrades

Standard Pre-Built Configurations:

286/20 With 512K, Hard Disk Drive, Monitor & Video Card						
Drives / Video	40MB-40MS	40MB-28MS	80MB-28MS	110MB-28MS 1:1 RLL	150-17MS 1:1 ESDI	320-16MS 1:1 ESDI
Mono	$1890	$1999	$2130	$2396	$3623	$4023
EGA	$2284	$2393	$2524	$2790	$4017	$4417
VGA	$2455	$2564	$2695	$2961	$4188	$4588

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Multisync XL 20" (1024x768) 2085

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2400 Baud Internal w/Bitcom 95
2400 Baud External 140

HAYES
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2400 External 415

MIGENT
1200 Pocket Modem w/cbl/software $90

PRINTERS*

Figures next to model numbers are Draft and LQ print speeds

NEC
P2200 170/55 .... 340 **P960XL** 400/140 . 1030
P5200 265/90 .... 515 **P5300** Wide 639
LC890 Postscript Laser Printer ..... Call

PANASONIC
1080I 144/28 ..... 160 **1091I** 192/38 180
1092I 289/48 ... Call **1592** 220/38 390
1595 290/51 ..... 425 **1524** 240/80 525

HEWLETT PACKARD
Deskjet ..... 690 **Laserjet Series II** 1685

TOSHIBA
321SL 216/72 .... 475 **341SL** Wide Carr . 615
351SX 360/120 Wide Carriage 937

CITIZEN
120D 120/25 ..... 149 **180D** 180/29 170
MSP40 240/40 .. 320 **MSP45** Wide ..... Cal
MSP50 250/50 .. 385 **T224** 200/132 605

DICONIX
150P 150/50 Portable 305

Your Dollar

PC BRAND 386/20 $2100

20 MHz Clock, Zero Wait Operation
Norton SI 24 • Landmark Speed 30MHz
1024K, 1.2MB or 1.44MB Drive, 101-Keyboard

Standard System Features:

- Intel 80386 Processor Operating at 20MHz with Zero Wait States in interleave mode delivering 30MHz Effective Throughput
- 1024K RAM standard expandable to 16MB via 32Bit RAM boards using 256K and/or 1MB 80ns RAM chips
- 1.2MB 5.25" or 1.44MB 3.5" Diskette Drive
- High Performance Dual Hard Drive/Floppy Drive controller
- Enhanced 101-key AT Style Keyboard
- High Capacity 200 Watt System Power Supply
- Real Time Clock/Calendar with 5 Year Battery
- 80287 or 80387 Co-Processor Support
- Industry Standard BIOS with full MS/DOS, OS/2, XENIX, NOVELL, 3COM and PCNET compatibility
- User configurable I/O timing permitting compatible operation with older peripherals or faster I/O for newer devices
- 8 Slot motherboard design (6 16Bit & 2 8Bit & 2 32Bit)
- Medium foot print case with 5 Disk Drive bays

Options:

- Tower Case • Factory Installed RAM Upgrades
- Custom configurations w/Name Brand peripherals of your choice
- Compaq® Style LCD Portable • 8MB 32Bit RAM Card Upgrade

Standard Pre-Built Configuration:

386/20 With 1024K, Hard Disk Drive, Monitor & Video Card

Video \ Drives	40MB-40MS	40MB-28MS	80MB-28MS	110-28MS 1:1RLL	150-17MS 1:1ESDI	320-16MS 1:1ESDI
Mono	$2590	$2699	$2830	$3096	$4323	$4723
EGA	$2984	$3093	$3224	$3490	$4717	$5117
VGA	$3155	$3264	$3395	$3661	$4888	$5288

PC BRAND 386/25 $2450

25 MHz Clock, Zero Wait Operation
Norton SI 28.3 • Landmark Speed 35MHz
1024K, 1.2MB or 1.44MB Drive, 101-Keyboard

Standard System Features:

- Intel 80386 Processor Operating at 25MHz with Zero Wait States in interleave mode delivering 35MHz Effective Throughput
- 1024K RAM standard expandable to 16MB via 32Bit RAM boards using 256K and/or 1MB RAM chips
- 1.2MB 5.25" or 1.44MB 3.5" Diskette Drive
- High Performance Dual Hard Drive/Floppy Drive controller
- Enhanced 101-key AT Style Keyboard
- High Capacity 200 Watt System Power Supply
- Real Time Clock/Calendar with 5 Year Battery
- 80287 or 80387 Co-Processor Support
- Industry Standard BIOS with full MS/DOS, OS/2, XENIX, NOVELL, 3COM and PCNET compatibility
- User configurable I/O timing permitting compatible operation with older peripherals or faster I/O for newer devices
- 8 Slot motherboard design (6 16Bit & 2 8Bit & 2 32Bit)
- Medium foot print case with 5 Disk Drive bays

Options:

- Tower Case • Factory Installed RAM Upgrades
- Custom configurations w/Name Brand peripherals of your choice
- Compaq® Style LCD Portable • 8MB 32Bit RAM Card

Standard Pre-Built Configurations:

386/25 With Hard Disk Drive, Monitor & Video Card

Video \ Drives	40MB-40MS	40MB-28MS	80MB-28MS	110MB-28MS 1:1RLL	150-17MS 1:1ESDI	320-16MS 1:1ESDI
Mono	$2940	$3049	$3180	$3446	$4673	$5073
EGA	$3334	$3443	$3574	$3840	$5067	$5467
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30MB 35MS ST138 w/XT Controller 380
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10 MHZ TURBO
32MB HARD DISK COMPLETE!!
$1,010

BASIC SYSTEM:

4.77/10 MHZ V-20
512K, 120NS RAM, installed
FUJITSU 360KB, floppy w/controller
2 par., 1 ser. & 1 game port, clock/calendar
Baby AT case, turbo, reset, keylock
150 watt power supply;
ENHANCED TACTILE KEYBOARD

NORTON SI = 4.0
LANDMARK = 11.4 MHz

FREE !! V-20 Processor

INCLUDED OPTIONS:

Monographic card, Hercules compatible
Casper Hi-Res amber monitor w/swivel base
32 MB MINISCRIBE Hard Disk, OMTI Controller

	No Hard Disk Drive	20 MB Miniscribe	32 MB Miniscribe	48 MB PTI 35MS
MONO SYSTEM Casper w/swivel base	$685	$985	$1,010	$1,160
COLOR SYSTEM Samsung w/swivel base	$855	$1,155	$1,180	$1,330
EGA SYSTEM Relisys w swivel base	$1,080	$1,380	$1,405	$1,555

FCC CLASS B APPROVED !

SUNNYVALE MEMORIES /286

12 MHZ TURBO
30 MB HARD DISK COMPLETE!!
$1,450

BASIC SYSTEM:

6/12 MHZ 80286, 0/1 wait state
512K, 80NS RAM, installed
FUJITSU 1.2 MB floppy
OMTI 8240 FD/HD CONTROLLER
2 par., 1 ser., 1game port
Phoenix BIOS
Battery backup, clock/calendar and hardware setup included
AT case, 3 half height exposed drive bays
Turbo, reset, turbo light, keylock
200 watt power-supply; **ENHANCED TACTILE KEYBOARD**

INCLUDED OPTIONS:

Monographic card, Hercules compatible
Casper Hi-Res amber monitor w/swivel base
30 MB PTI Hard Disk, OMTI 8240 Controller

NORTON SI = 13.7
LANDMARK = 16.1 MHz

	No Hard Disk Drive	30 MB PTI 35MS	48 MB PTI 35MS	63 MB Seagate 40MS
MONO SYSTEM Casper w swivel base	$1,125	$1,450	$1,550	$1,580
COLOR SYSTEM Samsung w/swivel base	$1,295	$1,620	$1,720	$1,750
EGA SYSTEM Relisys w swivel base	$1,520	$1,845	$1,945	$1,975

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16/20 MHZ 80386

NORTON SI = 22.0
LANDMARK = 26.7 MHz

48 MB-EGA!
COMPLETE CAD SYSTEM!
$3,025

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BASIC SYSTEM:

16/20 MHZ 80386, **0 wait state**
1 MB, 100NS DRAM, installed, expandable to 2 MB on motherboard.
2/4/8/16 MB 32 bit interleaved 20 MHZ memory options
384K CACHE for system BIOS & EGA BIOS
80387 16/20 MHZ. or, 80287 8/10 MHZ. option
OMTI 8240 FDD/HDD CONTROLLER 1:1 INTERLEAVE!!
8/16 or 20 MHZ or 10/16 or 20 MHZ keyboard controlled
1 32 bit 16/20 MHZ slot, 6 AT and 1 XT slots at 8/10 MHZ
1.2 MB FUJITSU floppy drive; **ENHANCED TACTILE KEYBOARD**
EGA, CGA, MDA, Hercules Adapter, ALL ON THE MOTHERBOARD!!
2 par., 2 ser. ports, light pen port, ALL ON THE MOTHERBOARD!!
Battery backup, clock calender, and hardware setup in ROM
3 EXPOSED AT STYLE CASE, w/200 watt Power Supply

INCLUDED OPTIONS:

Relysis 14" Hi-Res EGA Monitor w/swivel base
48 MB PTI RLL Hard Disk, OMTI 8247 1:1 Controller

	No Hard Disk Drive	30 MB PTI 35MS	48 MB PTI 35MS	63 MB Seagate 40MS
MONO SYSTEM Casper w/swivel base	$2,295	$2,595	$2,725	$2,760
COLOR SYSTEM Samsung w/swivel base	$2,450	$2,750	$2,880	$2,915
EGA SYSTEM Relisys w/swivel base	$2,595	$2895	$3,025	$3,060

FREE: EGA, CGA, MDA and HERCULES COMPATIBLE ADAPTER ON THE MOTHERBOARD!

SYSTEM FEATURES:

- ALL PORTS ON THE MOTHERBOARD
- ALL VIDEO ON THE MOTHERBOARD
- 7 slots available for options
- 10 MHz AT bus speed
- 20 MHZ interleave memory
- USES INEXPENSIVE 80ns DRAM 20 MHZ, 0 WAIT STATES!!
- 640X480 drivers for Autocad, Microsoft Windows, Lotus Products, 132X43.

ADVANCED OPTIONS:

- 20 MHZ 80387
- 2/6/14 MB 32 BIT INTERLEAVED MEMORY EXPANSION, 80 NS DRAM
- TOWER CASES ARE AVAILABLE!
- Multiuser software: OS2, PC-MOS, INTERACTIVE, UNIX, NOVELL
- 800X600 RESOLUTION DAUGHTER-BOARD

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277N	63MB SCSI, RLL, 40MS, HH	$ 485.
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3053	44MB, 25MS, Half Ht	$ 475.
6085	70MB, 28MS, Full Ht	$ 725.
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351	40MB, 35MS, 31/2", Low Pwr	$ 410.
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1355	140MB ESDI, 23MS	$ 1,500.
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V170	90MB RLL, 22MS, FH	$ 675.
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728	280MB SCSI, 20MS, W/CTRL	$ 1,995.
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LAN2-183	MAXTOR 1240, 2X EXTERNAL	$ 2,995.
LAN335E	4380E, 16MS, ESDI	$ 2,995.
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48MB SYSTEM 35MS PTI, OMTI 5527, Auto Prk	$ 475.
63MB SYSTEM 40MS SEAGATE, OMTI 5527	$ 510.
70MB SYSTEM 28MS MICROPOLIS OMTI 5520	$ 725.
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❖ Auto Configure ROM	
❖ Fastest RLL Controller	
❖ Tandy 1000 Version	$ 120.00
WESTERN DIGITAL WX1	$ 70.00
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AT CONTROLLERS:

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❖ 2 Floppies	
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❖ TRUE 1:1 Interleave	
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❖ 2 Hard Drives MFM, 2 Floppies	

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40MB SYSTEM	PTI 35MS, LOW PWR	$ 500.	$530.
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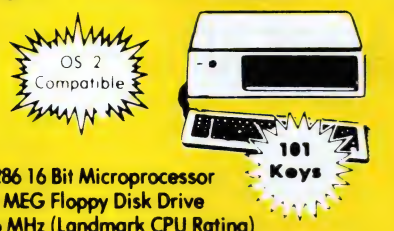

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- 1.2 MEG Floppy Disk Drive
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- 101 Key "AT Style" Keyboard • 0 Wait State
- BIOS w/Built-In Support for 3½" Drives
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- Parallel, Serial & Game Ports
- TTL Monochrome Monitor Card
- Super Fast V20 CPU • "AT Style" Keyboard
- Security Keylock & Clock/Calendar

Our Low Sale Price
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List $1195

10 MHz IBM® Turbo XT Compatible System

- 512K Professional Turbo XT Computer
- 360K Floppy Drive and Controller
- MS DOS & GW Basic
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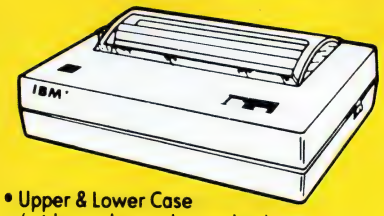

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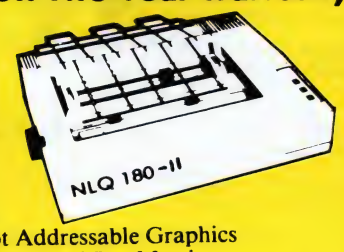

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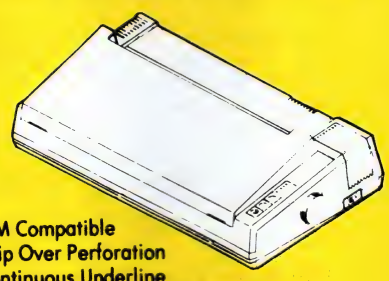

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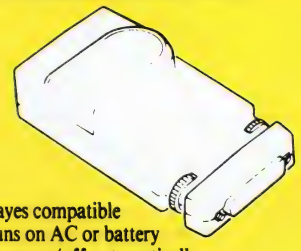

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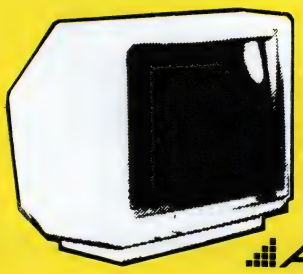

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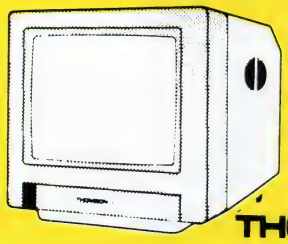

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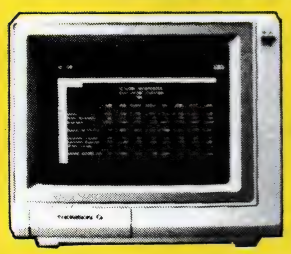

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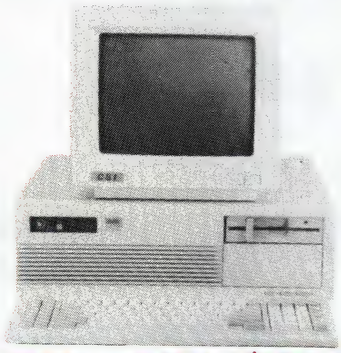

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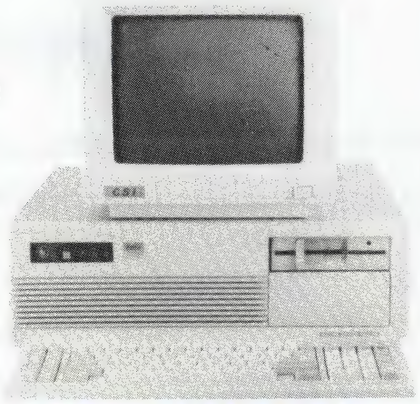

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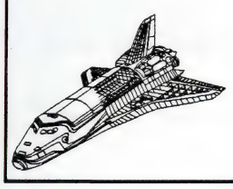

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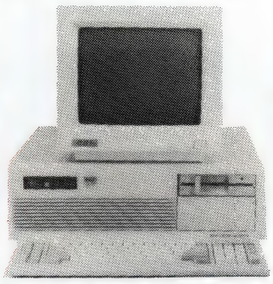

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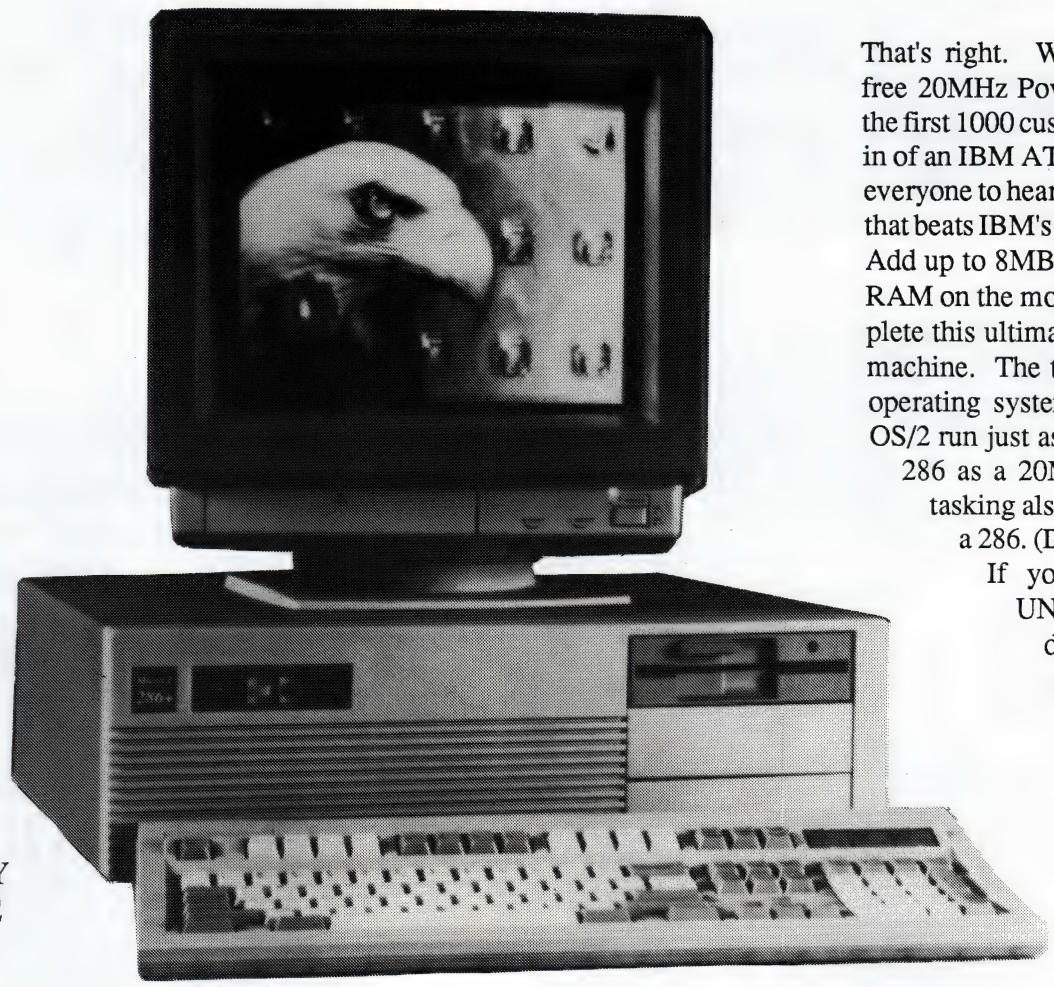

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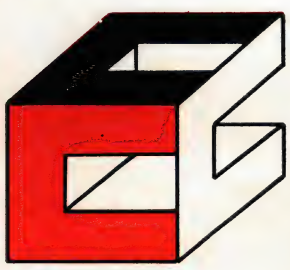

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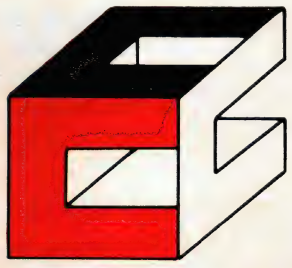

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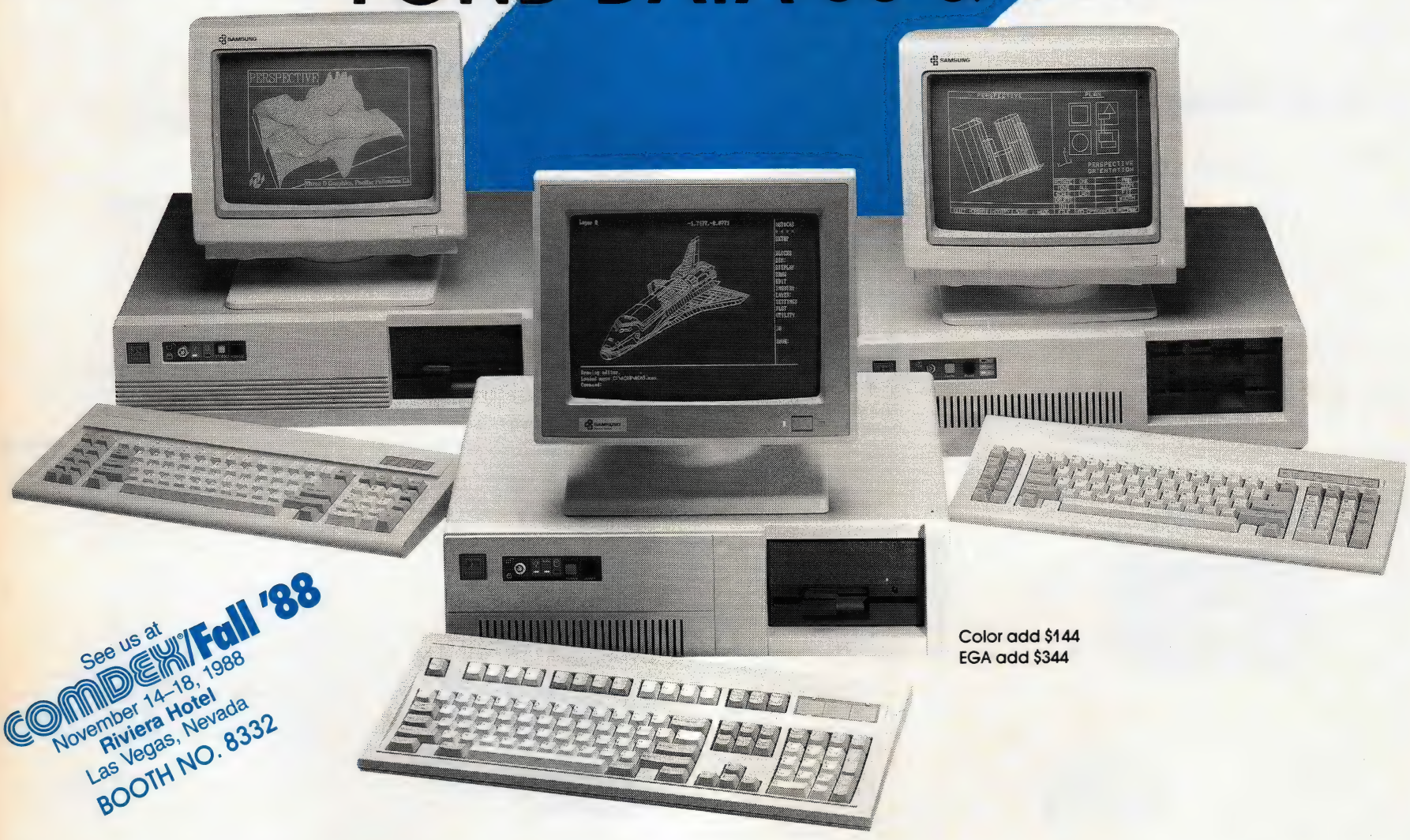

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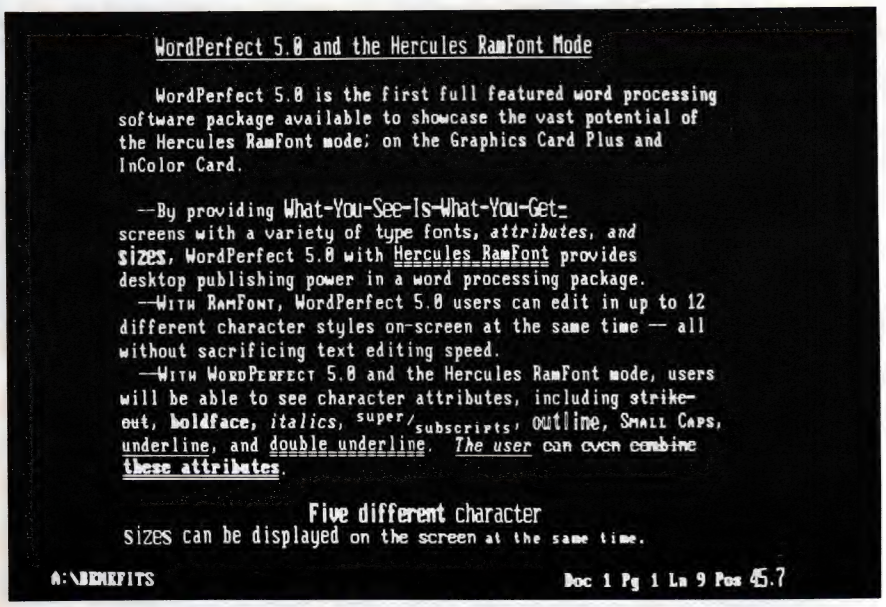
Hercules RAMFont Brings Improved WYSIWYG To WordPerfect 5.0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--With WordPerfect 5.0 and the Hercules RamFont mode, users will be able to see character attributes, including strike-out, boldface, italics, superscripts, outline, Small Caps, underline, and double underline. The user can even combine these attributes.
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WordPerfect 5.0 is the first full featured word processing software package available to showcase the vast potential of the Hercules RamFont mode. RamFont is available exclusively on the Hercules Graphics Card Plus and the Hercules In Color Card.

Hercules Computer Technology Inc. has announced that its proprietary RAMFont technology offers the only video mode that permits WordPerfect 5.0 users to view all of the new release's fonts and attributes on-screen simultaneously—while editing. RAMFont is available exclusively on the Hercules Graphics Card Plus and Network Card Plus (available in April) for monochrome displays, and on the Hercules InColor Cards for enhanced color displays. Version 5.0 of WordPerfect, the best-selling word processing package for the IBM PC and compatibles, will be released later this month

Alan Ashton, President of WordPerfect Corporation has been using the Hercules InColor Card for six months. "I'm currently using the Hercules InColor card on my computer and I like seeing underline, bold, italics, outline characters and other fonts and attributes in color directly as I type," said Ashton.

WordPerfect 5.0's attributes include boldface, redline, underline, double underline, and strike-through; font styles include italics, sub and superscript, fine print, small, normal, large, very large, and extra large fonts, outline (drop shadow), and small caps (please see attached chart for more details).

RAMFont also enables WordPerfect 5.0 to display a set of 256 often requested special characters and symbols in several different font styles. This special character set includes foreign language characters, technical symbols, Ancient Greek and other special characters, such as the ™ and ® symbols.

By contrast, PCs equipped with standard monochrome graphics or CGA can display only limited attributes and no alternate fonts in editing mode, while EGA and VGA can only display one alternate font or attribute—italics, small caps, underline, or 256 special characters.

"RAMFont is the only video display technology that allows WordPerfect 5.0 users to enjoy true "What-You-See-Is-What-You-Get" functionality," said Jim Harris, president of Hercules. "Hercules has brought to the screen—for the first time—the new, superior font capabilities that WordPerfect 5.0 users are enjoying on their printed documents."

RAMFont A De Facto Video Standard

According to Harris, RAMFont will be to WordPerfect 5.0 what the original Hercules Graphics Card was to Lotus 1-2-3; an indispensable aid for the serious user and a de facto video standard.

"RAMFont has already been described as the video standard of the future," said Harris. "Its use in WordPerfect 5.0 confirms RAMFont as the video standard for here and now. There is simply no better display mode for text and word processing applications."

"Traditionally, software developers have had to choose between the flexible but slow graphics mode, or the high performance text mode, which has limited display capabilities. Now software developers can have their cake and eat it too; RAMFont gives packages like WordPerfect 5.0 superior display capability without sacrificing speed."

Over 60 software packages now take adavantage of RAMFont's advanced video capabilities, including such leading packages as Micropro's WordStar 2000 Plus release 3.0, Microsoft's Word and Multiplan, Ashton-Tate's Framework II, and Lotus' 1-2-3, Symphony, and Manuscript.

Hercules' RAMFont Mode

Hercules' RAMFont mode combines the speed of text mode with much of the versatility of graphics mode. RAMFont simultaneously supports up to 12 different character styles on-screen, enabling users to see what their final copy will look like when printed out. Under RAMFont, application software can access up to 3,072 software-definable characters, graphics elements, or patterns. The Hercules InColor card can display these custom characters in up to 16 colors, or alternatively, 12,288 custom characters can be displayed in two colors.

Headquartered in Berkeley, Calif., Hercules Computer Technology, Inc. is a leading developer and manufacturer of video enhancement products for the IBM PC/XT/AT and compatibles.

Customers can get the name of their nearest Hercules dealer by calling toll-free (800)532-0600. For more information contact Hercules, 921 Parker Street, Berkeley, CA 94710. Phone (415)540-6000.

The Information Services Department phone number at WordPerfect is (801)225-5000. ●

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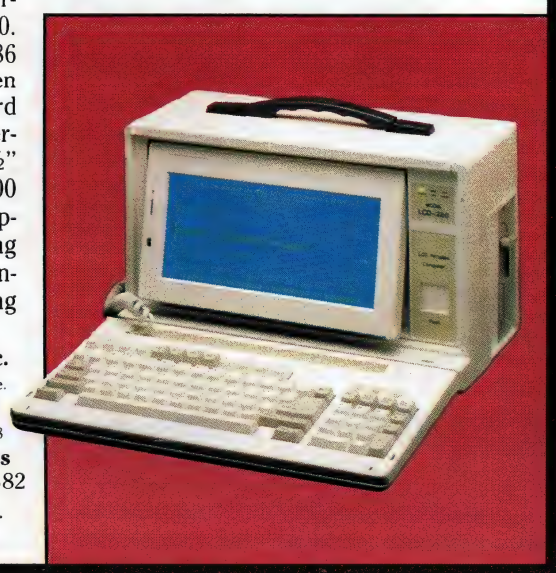

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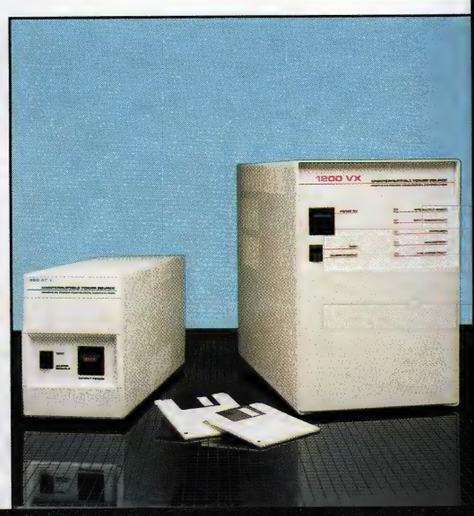

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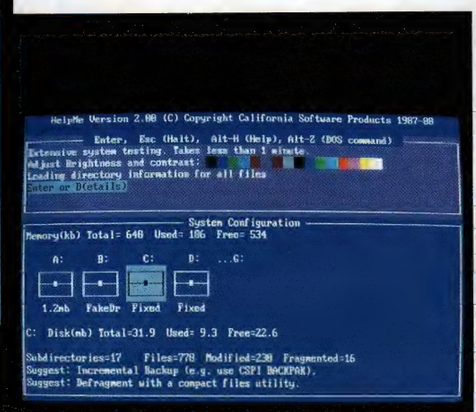
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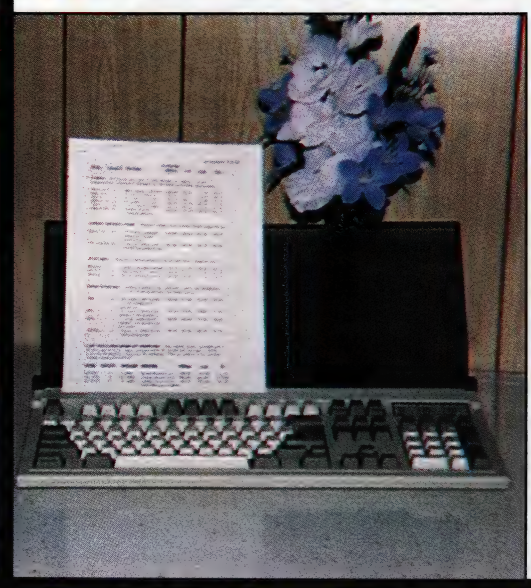

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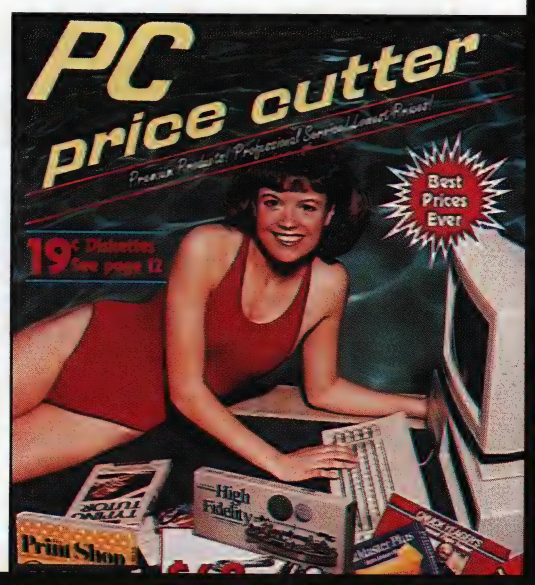

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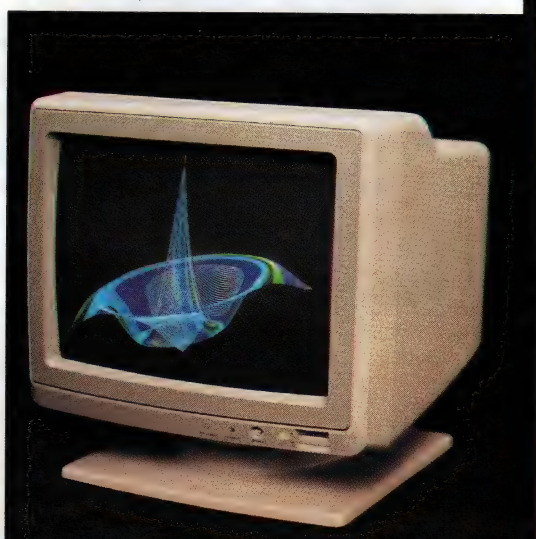

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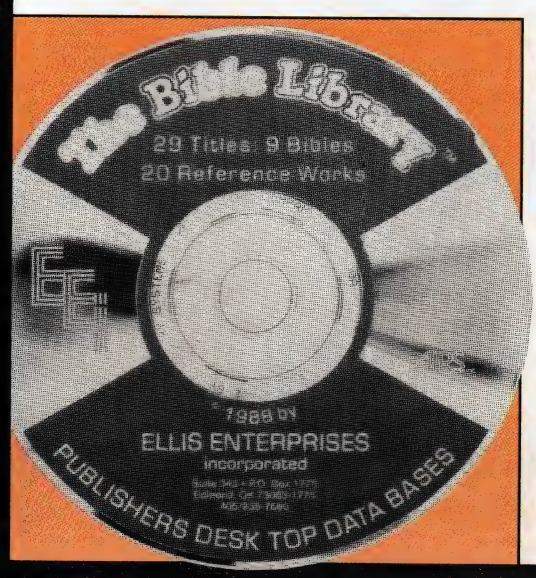

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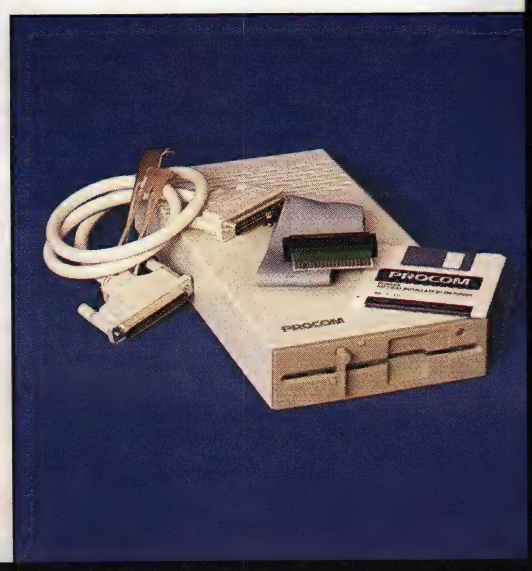

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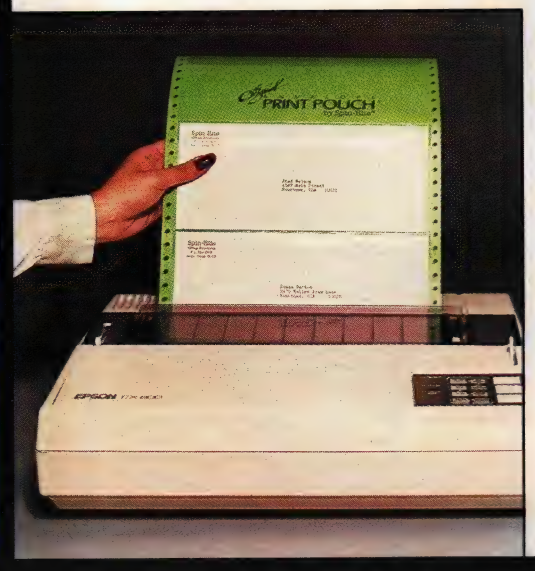

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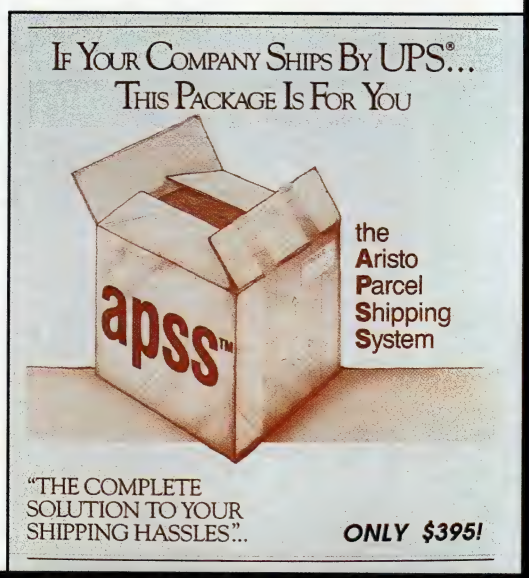
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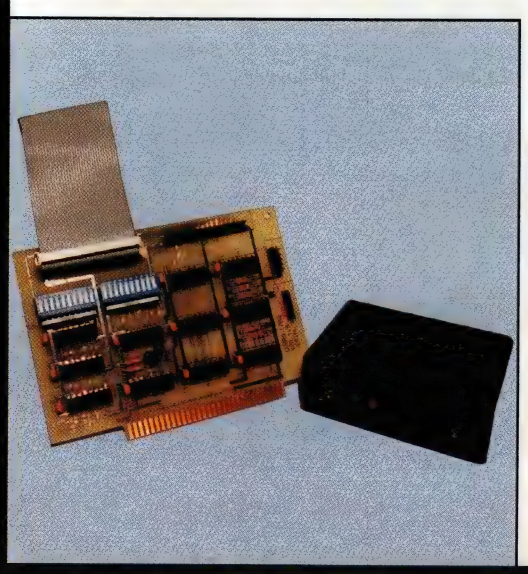

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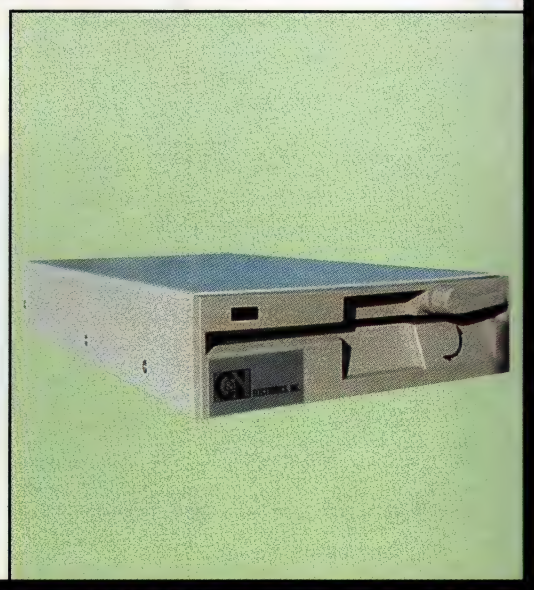

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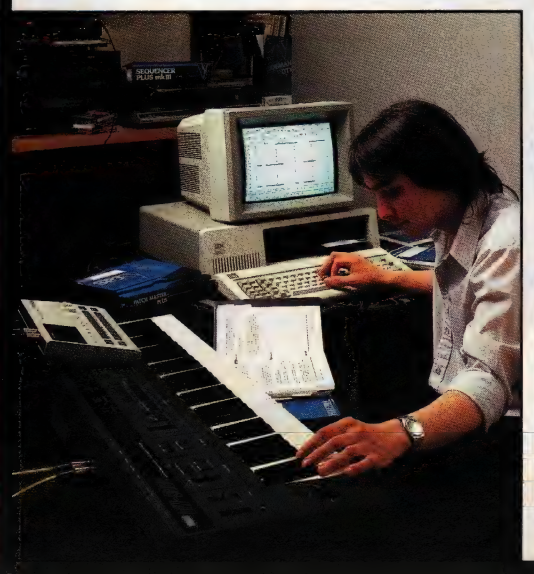

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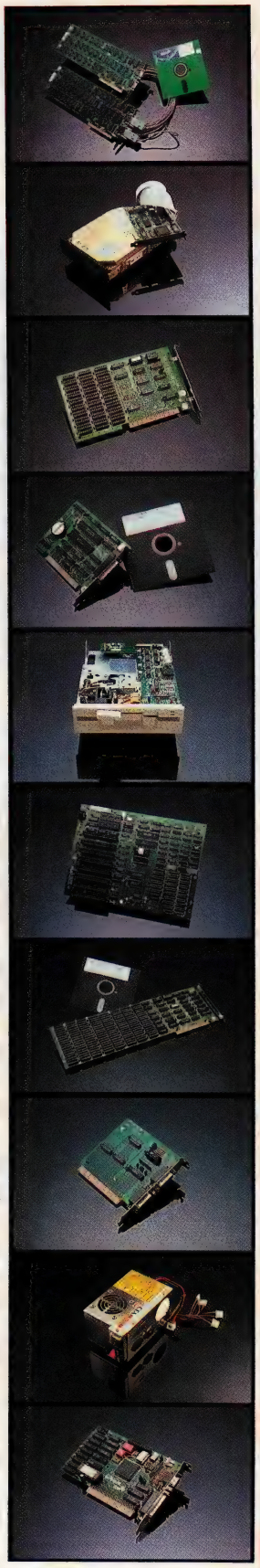

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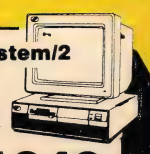

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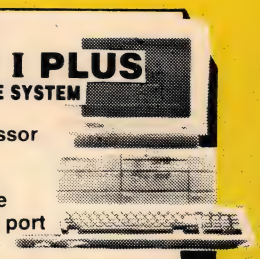

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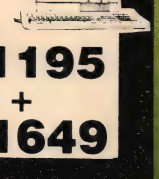

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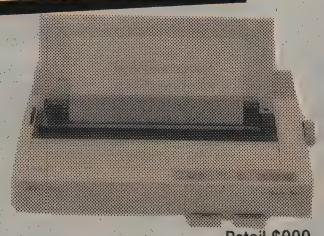

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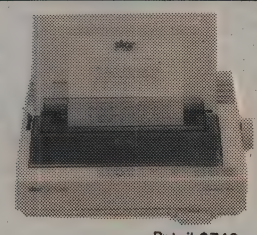

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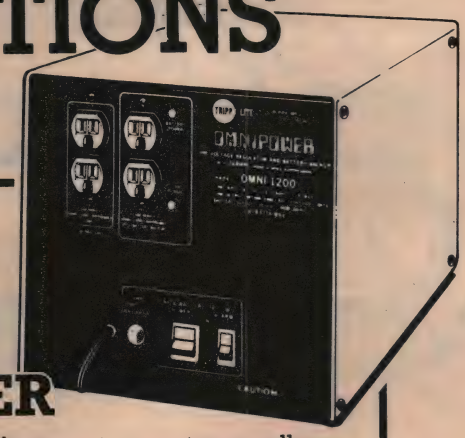

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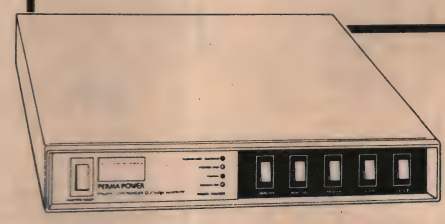

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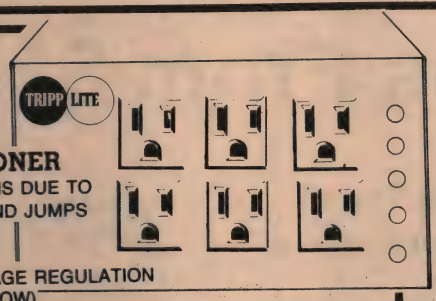

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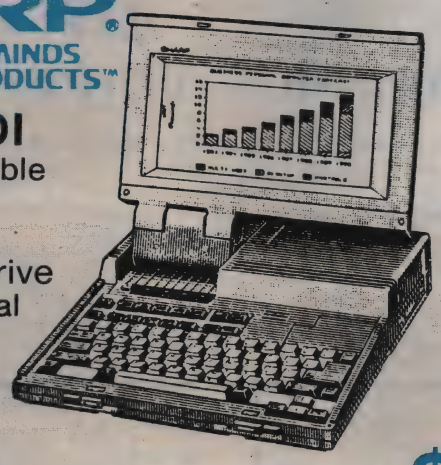

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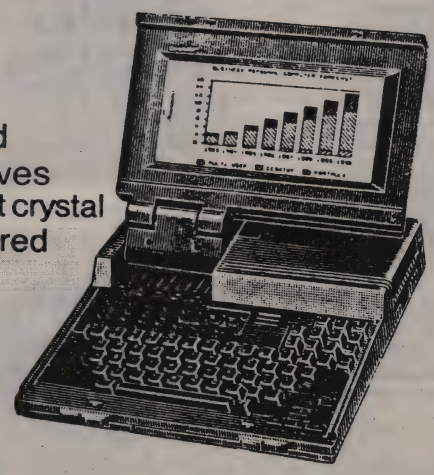

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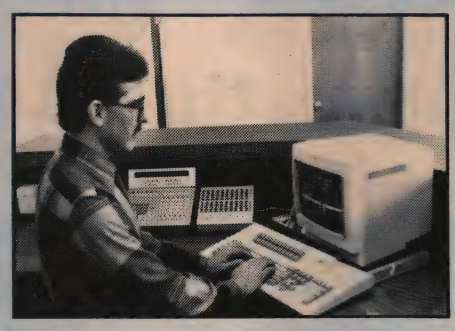
Important Answers to Important Questions About Lyco Computer!

Why shop at Lyco Computer?

Lyco Computer is one of, if not the largest, oldest, and most established firms to provide only quality name brand computer products to the general public at prices 30% to 50% lower than retail. We've set many industry standards, and we are setting the pace for many more in the future. Our standards include: a separate department for customer service; a price guarantee; guaranteed factory fresh merchandise; diverse payment and shipping policies, including a C.O.D. policy which allows customers to have products in their hands before paying anything. Selection places Lyco at the forefront of the industry. Due to our in-stock volume, we cannot advertise all of our products. Enjoy one-stop shopping for national products by calling our marketing staff for products and low prices.

How do I know I will get the product I need?

Our marketing staff is well educated in the computer industry. They receive continuous formal training by our manufacturers which enables them to develop and maintain a high degree of expertise on the products they represent. Though our strict guarantee on providing only new merchandise prohibits free trial periods and a guarantee on compatibility, a wealth of knowledge is available to our customers to help with the purchasing decision. As thousands of people every week capitalize on our savings and services, we hope you too, will make Lyco Computer your first choice.



What about warranty or service?

At Lyco Computer we decided several years ago that a customer service department was needed in the industry. Unfortunately, few of our competitors offer this service. Our product line enjoys "name brand recognition." We back all of our manufacturer's warranties in accordance with the manufacturer's stated warranty terms. These warranty terms are normally outlined in each owner's manual or explained at a retail store near you. Our customer service department is available to provide assistance in all warranty matters. Many manufacturers will allow defective products to be exchanged. Before you return any item that appears to be defective, we ask that you call our customer service department. They will assist you in determining if the product is defective, and then will give you a special authorization number and speed processing of your order.

Will you rush an item to me?

Since 1981, we have set the standard in the industry by processing orders within 24 hours — not 4 to 6 weeks. We offer next day air, two day air, standard UPS, and postal international shipping services. With a multi-million dollar inventory and the utilization of an IBM mainframe for processing, our records show we fill 95% of our orders daily. Temporary shortages are normally filled within 10 days. Our experience indicates most of our customers will wait the ten days in order to receive the benefit of our price savings and products. If an order cannot be filled within 60 days, money is refunded in full in the hope that the customer will reorder when the product is available. Any time prior to shipment, customers may cancel or change the out of stock product by simply contacting our customer service department.

How do I order?

Simply send your order to Lyco Computer, P.O. Box 5088, Jersey Shore, PA 17740. Or, call either **1-800-233-8760** or **717-494-1030**. We provide four payment methods. We have always accepted C.O.D. orders through UPS. Prepaid orders over $50 are shipped freight free. For orders under $50, please add $3 for freight. Orders prepaid by a certified check or money order payments, merchandise is shipped immediately. Personal and company checks require a 4 week waiting period prior to shipping. Visa and Master Card orders are accepted for your convenience, but we cannot pass along the 4% discount offered for cash. Purchase orders are accepted from Educational Institutions. We only charge sales tax on items delivered in Pennsylvania. For APO, FPO, and international orders, please add $5 plus 3% for priority mail. Advertised prices and availability are subject to change.

HOURS

9AM-9PM Mon.-Fri.
10AM-6PM Sat.
Customer Service
(717) 494-1670
9AM-5PM Mon.-Fri.

PRICE GUARANTEE

Since 1981, we have led the industry by continuing to offer the lowest national prices while providing quality service. Many companies have come and gone trying to imitate our quality and service. If by some oversight we do not have the lowest prices advertised on the products you desire, then we would appreciate the opportunity to rectify this oversight.

Lyco Computer

Marketing & Consultants

Since 1981

Air orders processed within 24 hours.

TOSHIBA

Floppy Disk Drives

ND-04D 5¼" 360 KB 48TPI PC/XT Compatible	$89.95
ND-08DE-G 5¼" 1.6 MB 96TPI PC/AT Compatible	$109.95
ND-354A 3½" 720KB PC XT/AT Compatible	$119.95
ND-356T 3½" 1.44 MB PC/AT Compatible	$129.95

Don't limit yourself. Buy top quality drives to suite your needs.

Seagate

Hard Drive Upgrades for IBM PC and Compatibles!

5.25" Half Heights

ST 225	20 meg 65 msec MFM	215.95
ST 225N	20 meg SCSI	289.95
ST 238R	30 meg RLL	229.95
ST 251	40 meg 40 msec MFM	345.95
ST 251-1	40 meg 28 msec MFM	429.95
ST 277R	65 meg 40 msec RLL	389.95
ST 277N	64 meg SCSI	439.95

3.5"

ST 125	20 meg 40 msec MFM	235.95
ST 125N	20 meg SCSI	299.95
ST 138R	30 meg RLL	249.95
ST 138N	30 meg SCSI	329.95
ST 157R	49 meg RLL	399.95
ST 157N	48 meg SCSI	439.95
ST 125	20 meg Interanl Card	299.95
ST 138R	30 meg Interanl Card	335.95
ST 157R	49 meg Internal Card	485.95

5.25"Full Heights:

ST 4053	40 meg 28 msec MFM	469.95
ST 4096	80 meg 28 msec MFM	559.95

Call for kit pricing & specials.
Ask about our Seagate Paired Solutions!

E-Z Installation

1-Year Warranty

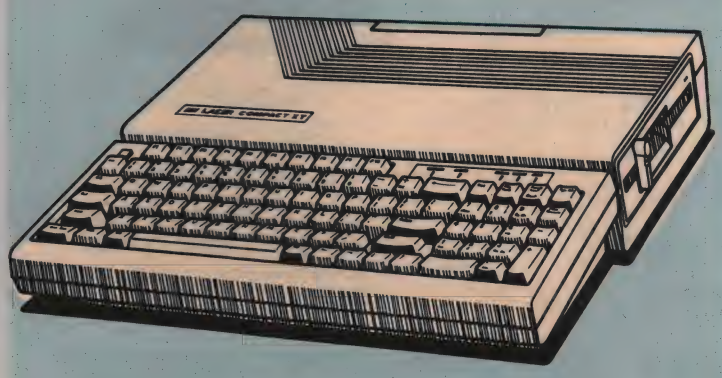
TO ORDER CALL:

1-800-233-8760

LASER

MAKING COMPUTERS AFFORDABLE !

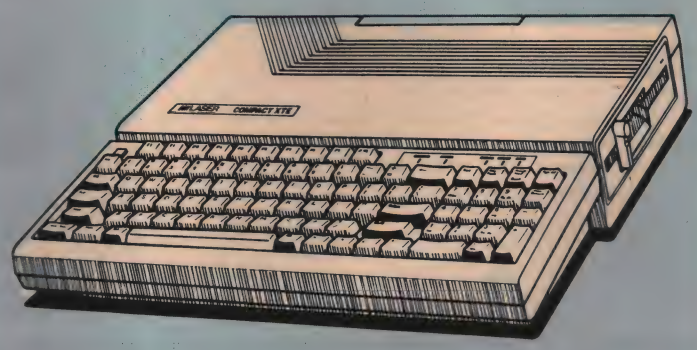
Join the thousands who switched to the cost effective Laser Apple Compatibles



Laser 128

- RAM-128K
- Built in Drive
- Parallel Port
- Hi Res Graphics

$369.95



Laser 128EX

- Built in Drive
- 1 MHZ, 2.3 MHZ or 3.6 MHZ Selectable
- RAM-384K
- Apple Compatible

$419.95

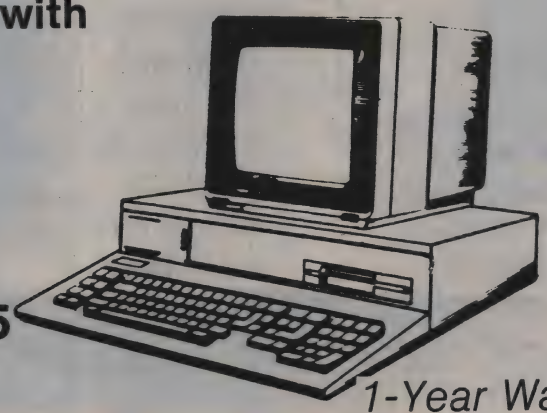
LASER TURBO XT MODEL II

Introducing the new generation of XT with features which out-perform the conventional XT:

- Dual speed 4.77-10 MHZ
- 640K Std.
- Built in color card
- Built in floppy drive
- Monitors available

IBM PC-XT Compatible

$629.95



1-Year Warranty

Lyco Computer

Marketing & Consultants

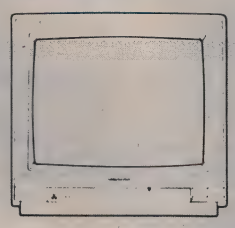
Since 1981

Air orders processed within 24 hours.

MAGNAVOX

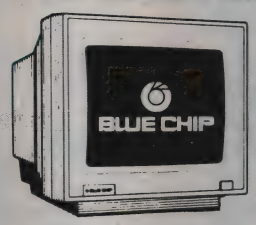
CM8762 **$239.95**

- 17% Larger Screen Than Standard 12" Monitors
- RGB TTL (CGA)
- Composite Video Inputs
- 640X 240 Resolution
- Green Text Display Switch
- Audio Input
- Built-in Tilt Stand
- One-Year Limited Warranty



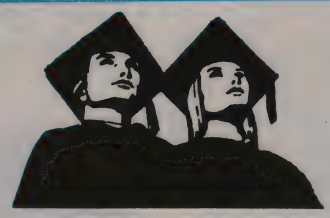
BLUE CHIP

TTL Green Monitor



$54.95

- 720 x 348 in Graphics Mode
- Separate TTL Signal
- Non-glare "Flicker Free" Tube



Attention Educational Institutions:

If you are not currently using our educational service program, please call our representatives for details.

MONITORS

Thomson:

4120 CGA	$219.95*
GB 100	$119.95*
GB 200 Super Card	$169.95*

**Quantities Limited*

NEC

Multisync II	$589.95

Blue Chip:

BCM 12" Green TTL	$54.95
BCM 12" Amber TTL	$69.95

Magnavox:

BM7652	$79.95
BM7622	$79.95
7BM-613	$79.95
7BM-623	$79.95
CM8502	$179.95
CM8505	$199.95
9CM-053	$339.95
CM8762	$239.95
8CM-515	$259.95
CM9043	$CALL
8CM-873	$499.95
9CM-082	$439.95

MODEMS

Avatex:

1200e	$65.95
1200i PC Card	$65.95
1200p	$89.95
1200hc Modem	$89.95
2400	$149.95
2400i PC Card	$139.95

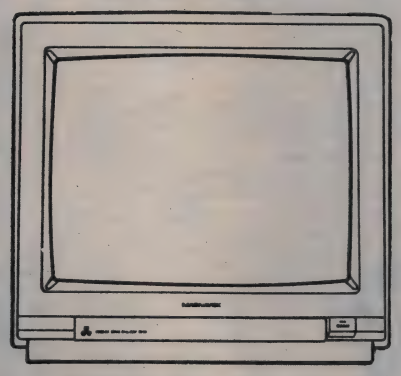
Hayes:

Smartmodem 300	$139.95
Smartmodem 1200	$279.95
Smartmodem 2400	$419.95

US Robotics:

Courier 1200	$169.95
Courier 2400	$299.95

CM 8762



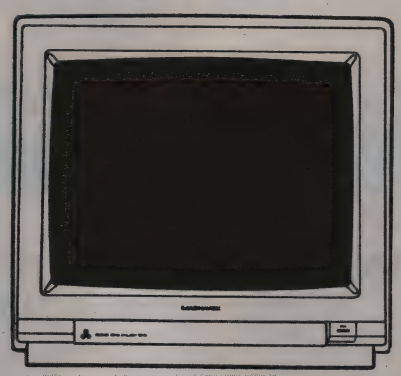
- RGB TTL (cga)
- green text display switch
- built-in tilt stand
- interface cables
- 1-year warranty

$239.95

MAGNAVOX

BM7652	$79.95
BM7622	$79.95
7BM-613	$79.95
7BM-623	$79.95
CM8502	$179.95
CM8505	$199.95
9CM-053	$339.95
CM8762	$239.95
8CM-515	$CALL
CM9043	$CALL
8CM-873	$499.95
9CM-082	$439.95

9CM 082



- VGA compatible
- 256 colors at one time
- 800 X 600 displays
- VGA interface cable

$439.95

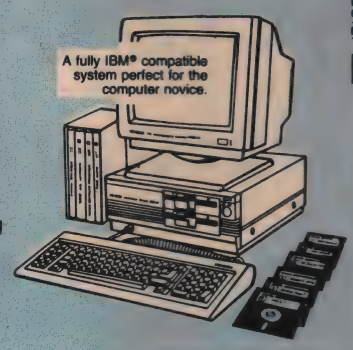
TO ORDER CALL:

1-800-233-8760

- Guaranteed IBM® PC/XT Compatible
- Turbo CPU-8MHz or 4.77 MHz Switchable
- Two 360K Floppy Disk Drives
- 3-in-1 Graphics Card (CGA Color, Monochrome, Hercules™)
- Parallel Port
- Serial Port
- Total of 7 Expansion IBM® Slots
- 84 Keys–"AT" Style Keyboard
- Monitor: 14" CGA-Compatible RGB Color
- 3-Year Warranty
- **Over 20 More Features**

VENDEX® 888 LTD Color

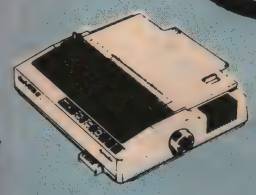
- Clock/Calendar with Battery Backup
- Game Port for Two Joysticks (Joysticks not included)
- Light-Pen Port (Light-Pen not included)
- Microsoft™ MS-DOS™ Operating System
- Microsoft™ GW Basic™
- Vendex Headstart™ Operating Environment
- Hot™ Pop-Up Services Executive Systems Desktop Manager



Star Micronics NX2400

System Price!

$1899.95



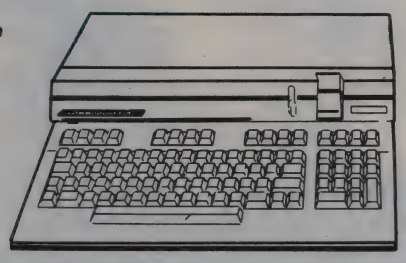
- Star makes 24-pin quality more accessible to those on a budget
- 170 cps Draft
- Friction & Push Tractor Feeds

COMMODORE 128 D System

$439.95

Commodore 128D and Magnavox 8CM515

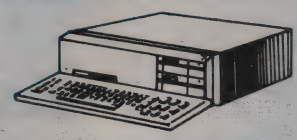
$689.95



COMMODORE HARDWARE

64C Computer	$149.95
C128D Computer/Drive	$439.95
1541 II Disk Drive	$179.95
1581 Disk Drive	$189.95
Excel FSD-2+ C64 Drive	$149.95
1802C Monitor	$179.95
1084 Monitor	$279.95
C1351 Mouse	$39.95
1764 RAM C64	$117.95
Colt PC	$679.95

COMMODORE COLT PC

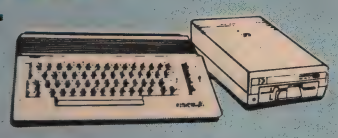


- IBM PC Compatible
- 640K Std.
- Two 5¼ Drives Std.
- Expansion for Hard Drive
- Turbo Processor
- MSDOS + GW Basic Included

$679.95

- Serial + Parallel Ports
- Mono/RGB Color Card Included

COMMODORE 64C Computer



- 64K RAM
- Serial Port
- Expansion Port
- Two Joystick/Paddle Ports
- Video Port
- RF TV Port
- Built-in Basic 2.0

$459.95

System Price!

COMMODORE 1541 II Disk Drive

- 170KB of Data (formatted)
- 5¼ inch Floppy Disk
- Data Transfer Rates 400 Bytes per Second

SEIKOSHA 180 VC

- 100 cps Draft
- 24 cps NLQ
- Tractor & Friction Feed
- Commodore Direct Connect

$10 off any program with this system.

NEW!

Seagate ST138R 30 Meg Internally Mounted Card

- Premounted on its own Controller Card
- EZ Slot Installation (app. 10 min.)

$335.95

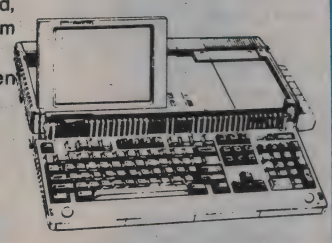
20-30-49 meg drives available!

PC COMPATIBLE HARDWARE

Blue Chip Popular	$549.95
Vendex Headstart Color	$969.95
Vendex Headstart Mono	$799.95
Vendex Headstart 888 LTD Color	$1599.95
Zucker CGA ColorCard	$89.95
BCC CG ColorCard	$94.99
Mitsubishi 310/AT	$1229.95
ATI Graphics Solution	$129.95
ATI EGA Wonder	199.95
ATI VIP	$299.95
Kraft PC Joystick Card	$24.95

AMSTRAD PPC 640

- 2400/1200/300 Baud, Hayes Compatible Modem built in.
- Supertwist LCD Screen
- Enhanced Keyboard
- PC Compatibility
- 640K Memory



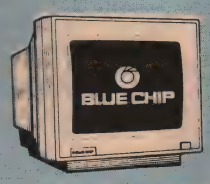
$779.95

LASER Compact XT Computer

- Built in 512K
- Built-in Disk Drive
- Built-in Printer Port
- Built-in Joystick/Game Paddle Port
- Built-in Super Turbo Clock Speed
- Built-in Video Display
- Built-in Speaker
- Built-in RS232C Serial Port

$699.95

System Price!

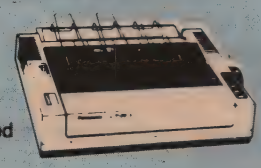


TTL Green Monitor

- 720 x 348 in Graphics Mode
- Separate TTL Signal
- Non-glare "Flicker Free" Tube

BLUE CHIP

Panasonic Office Automation 1080i Model II



- 150 cps Draft Mode
- NLQ Mode
- Friction & Tractor Feed
- 2-Year Warranty

$10 off any program with this system.

Lyco Computer

Marketing & Consultants

Since 1981

Air orders processed within 24 hours.

ATARI

Access:

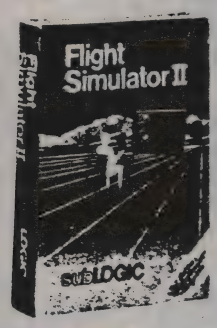
Triple Pack $11.95
Leader Bd. Triple Pack . $9.99

Activision:

Ghostbusters $9.99
Music Studio $19.95
Road Race $9.99
Solid Gold Vol. 1 ..... $9.99

Broderbund:

Printshop $25.95
Printshop Companion .. $22.95
Graphic Lib. 1,2,3 ..... $13.95
Bank St. Writer $27.95



Electronic Arts:

Super Boulderdash $8.95
Lords of Conquest $8.95
One on One $8.95
Pinball Constr. Set $8.95
Starfleet I $32.95

Microleague:

Microleague Baseball .. $22.95
General Manager $16.95
Stat Disk $13.95
'87 Team Disk $13.95

Microprose:

Conflict in Vietnam $22.95
F-15 Strike Eagle $19.95
Silent Service $19.95

Mindscape:

Bop n Wrestle $16.95
Gauntlet $20.95
Mastertype $22.95

Origin:

Autoduel $22.95
Ultima III $22.95
Ultima IV $34.95

Strategic Simulations:

Eternal Dagger $25.95
Gettysburg $37.95
Phantasie $25.95
Phantasie II $25.95
Shiloh $25.95

Sub Logic:

Flight Simulator II $30.95
Scenery Disks ..... $CALL

ATARI ST

Access:

Leader Board $22.95
10th Frame $22.95

Activision:

Music Studio $27.95
GFL Football $22.95

Broderbund:

Superbike Challenge ... $12.95
Typhoon Thompson $20.95

Electronic Arts:

Alien Fires $25.95
Hunt for Red October .. $31.95
Rockford $19.95
Bard's Tale $31.95
Scrabble $25.95
Chessmaster 2000 ..... $27.95

Epyx:

Dive Bomber $22.95
Death Sword $11.95
Impossible Mission 2 ... $22.95
Metrocross $13.95

Firebird:

Jinxter $22.95
Carrier Command $25.95
Universal Military Simulator $27.95

Microprose:

Silent Service $22.95
F-15 Strike Eagle $24.95
Gunship $28.95

Microleague:

Microleague Baseball .. $33.95
General Manager $16.95
Wrestling $25.95

Mindscape:

Harrier Combat Simulator $28.95
Road Runner $28.95
Super Star Ice Hockey . $28.95

Origin:

Autoduel $22.95
Moebius $22.95
Ultima IV $34.95

Strategic Simulations:

Phantasie $25.95
Questron II $31.95
Warship $36.95

Sub Logic:

Flight Simulator II $30.95
Scenery Disks ..... $CALL

Timeworks:

Word Writer ST $44.95
Partner ST $27.95
Data Manager ST $44.95

Unison World:

Printmaster $19.95
Art Gallery 1 or 2 ..... $14.95

AMIGA

Access:

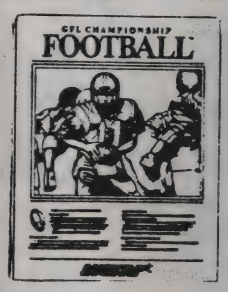
Wld. Class Leader Bd. . $25.95

Activision:

GFL Football $25.95
Romantic Encounters .. $22.95
Galactic Invasion $14.95

Electronic Arts:

Awesome Arcade Pack $30.95
FA/18 Interceptor $30.95
Ferrari Formula One ... $30.95
Weaver Baseball $30.95
World Tour Golf $24.95



Epyx:

Destroyer $22.95
Sub-Battle Simulator ... $27.95
Winter Games $11.95
Apshai Trilogy $11.95

Firebird:

Starglider $14.95
Guild of Thieves $25.95

Microprose:

Silent Service $22.95

Mindscape:

Balance of Power $27.95
Harrier Combat Simulator $27.95
Super Star Ice Hockey . $27.95
Uninvited $27.95

Origin:

Autoduel $22.95
Ogre $17.95
Ultima III $22.95

Strategic Simulations:

Gettysburg $36.95
Kampfgruppe $36.95
Phantasie $25.95
Phantasie III $25.95

Sub Logic:

Flight Simulator II $31.49
Jet $31.49
Scenery Disks ..... $CALL

Unison World:

Print Master $25.95
Art Gallery 1 or 2 ..... $14.95
Fonts & Borders $17.95
Art Gallery Fantasy $13.95

apple

Access:

Echelon $25.95
Wld. Class Leader Bd. . $22.95
Famous Courses $11.95
Triple Pack $11.95

Activision:

Aliens $9.95
Champ. Baseball $9.95
GBA Basketball $9.95
GFL Football $22.95
Might & Magic $28.95
Maniac Mansion $19.95
Post Cards $14.95
Shanghai $19.95
Zork Quest $7.95

Broderbund:

Airheart $9.99
Printshop $26.95
Printshop Companion .. $22.95
Graphic Library 1,2,3 .. $14.95
Carmen San Diego Europe $25.95
Fantavision $28.95
On Balance $33.95
Toy Shop $28.95
Wings of Fury $20.95

Electronic Arts:

Bard's Tale $27.95
Bard's Tale III $30.95
Death Lord $25.95
Pinball Constr. Set $9.99
Strike Fleet $22.95
Yeager's AFT $25.95
Wasteland $30.95
Bard's Tale II $30.95

Epyx:

California Games $22.95
Death Sword $11.95
Home Video Producer . $27.95
LA Crackdown $27.95
Rad Warrior $11.95
Str. Sport Basketball ... $22.95
Str. Sport Baseball $22.95
Spider Bot $11.95
Print Magic $33.95
Movie Monster $11.95
Winter Games $11.95

Firebird:

Starglider $11.95
Elite $9.99
Guild of Thieves $25.95

Microleague:

Microleague Baseball .. $22.95
General Manager $16.95
Stat Disk $11.95
'87 Team Disk $13.95

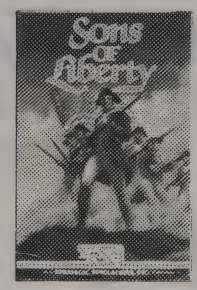
apple

Microprose:

Conflict in Vietnam $22.95
F-15 Strike Eagle $19.95
Silent Service $19.95
Pirates $22.95
Solo Flight $19.95

Mindscape:

Indoor Sports $17.95
Infiltrator $17.95
Infiltrator 2 ..... $17.95
Paperboy $22.95
Super Star Ice Hockey . $22.95



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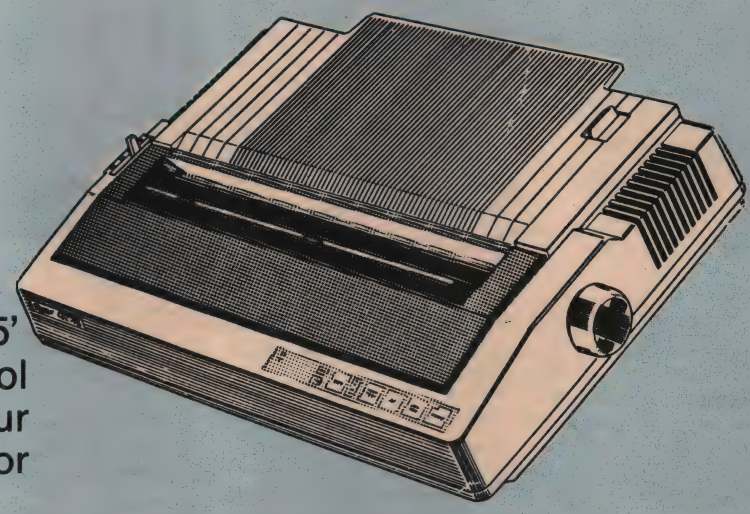

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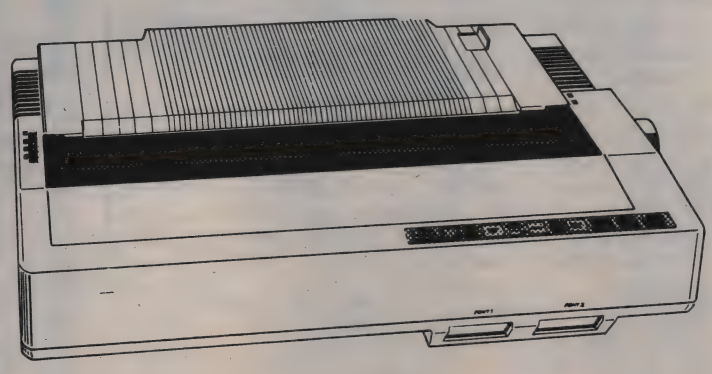

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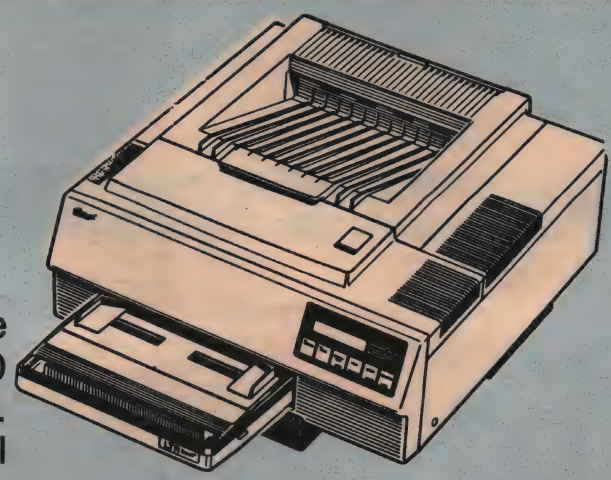

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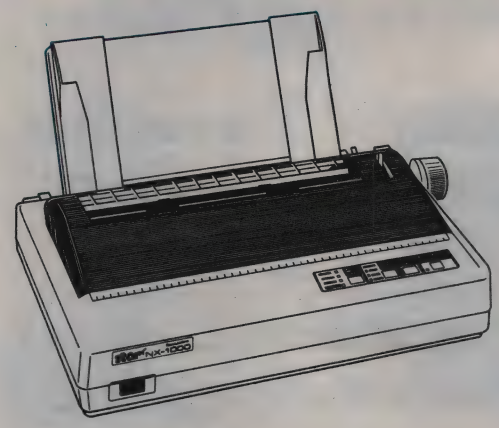

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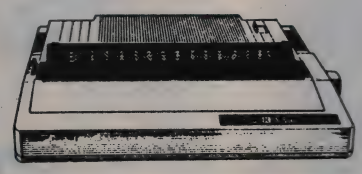

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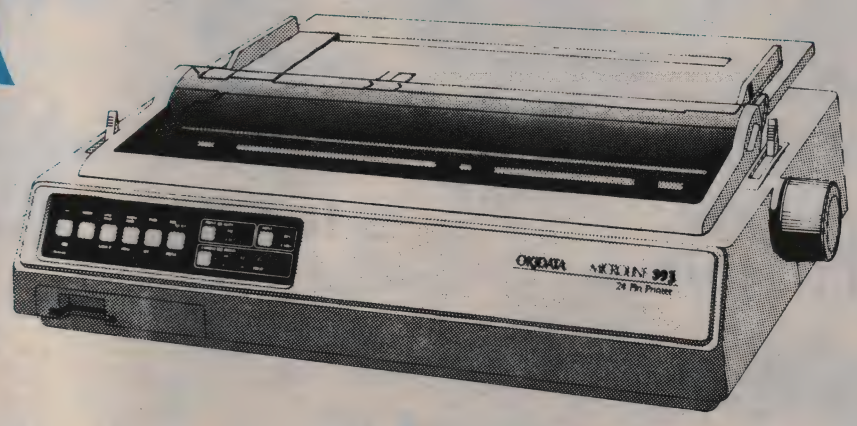

393: The Okidata 393 puts lightening quick speed of 450 cps draft and 120 LQ mode at your command. Add to this Okidata's paper park feature, push tractor and standard 30K buffer and you have a 24 pin printer capable of the most demanding office environment.

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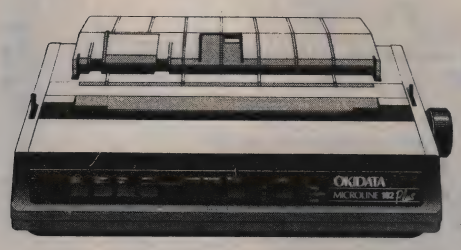

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Laser 6	$CALL
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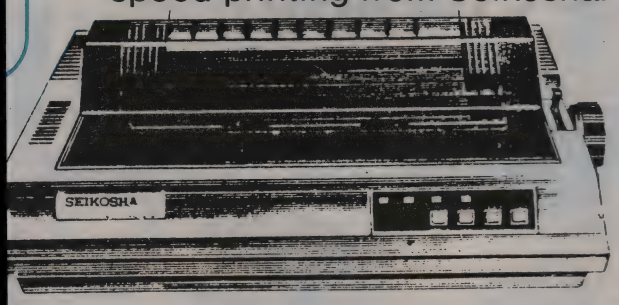

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- 100 Cps Draft
- 24 Cps NLQ
- Tractor & Friction Feed
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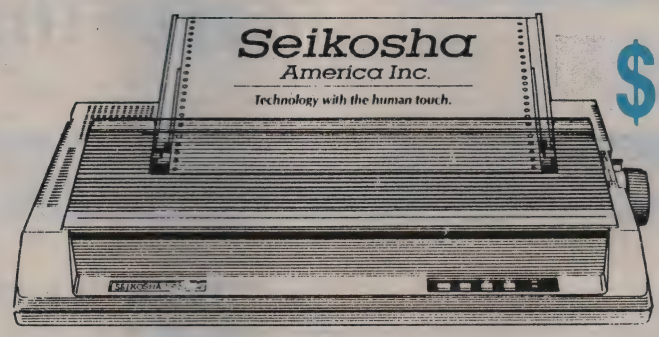

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SK 3000ai: Quiet printing at 300 cps draft and 50 cps NLQ mode. Seikosha adds easy character and print style selection for superb NLQ printing. Standard parallel centronics and RS 232 ports allow for a variety of needs

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- Letter quality 54 cps
- 135 cps Draft
- Automatic paper loading
- 16 K buffer

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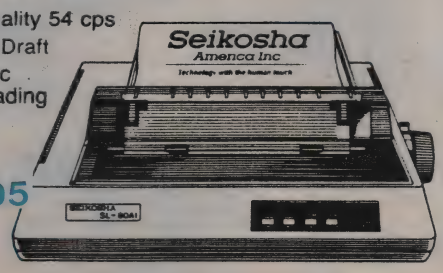

5420 FA

- 420 cps Draft
- 104 cps NLQ
- Friction/tractor feed
- 2-year warranty

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- 136 column
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- bi-directional

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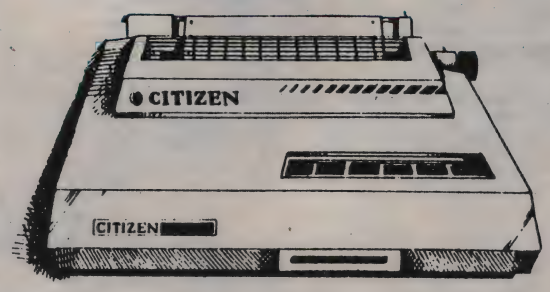

MSP-40

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- 200 cps draft
- 40 cps NLQ
- graphics
- front control panel

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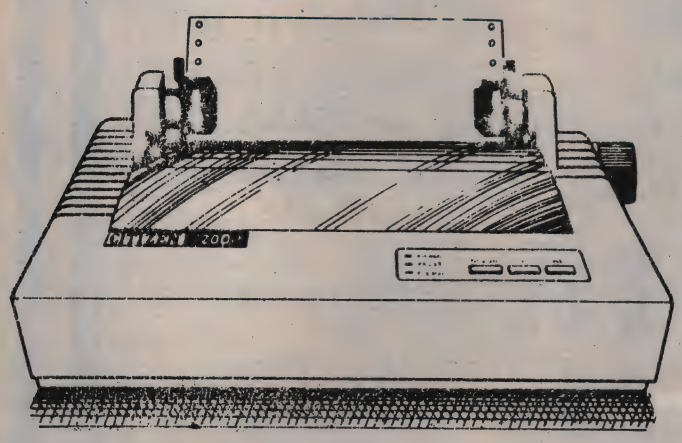
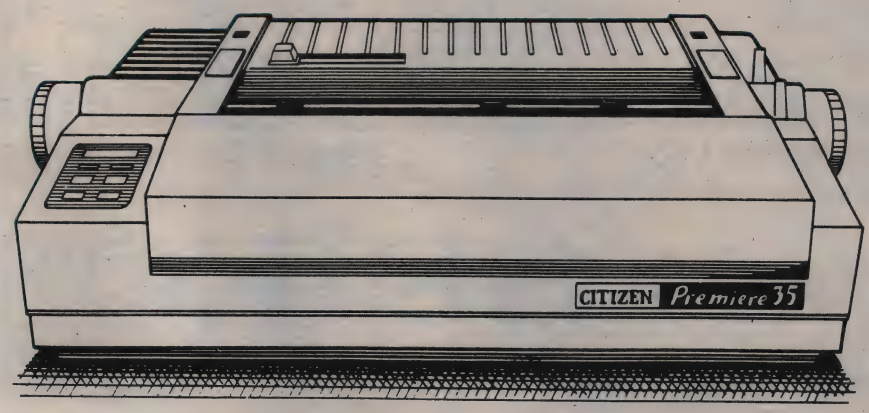


120D

- 120 cps draft
- 25 cps NLQ
- IBM, Epson compatible

149.95



Premiere 35

- 35 cps NLQ
- LCD display
- 136 column
- word processing compatible

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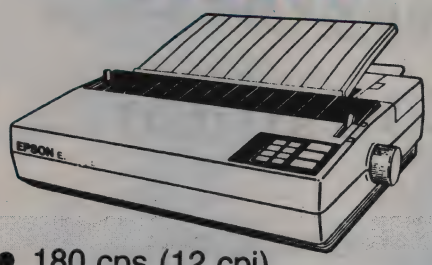
LX-800



- 180 cps (12 cpi)
- 30 cps NLQ
- front control panel

$184.95

LX800	$184.95
FX850	$339.95
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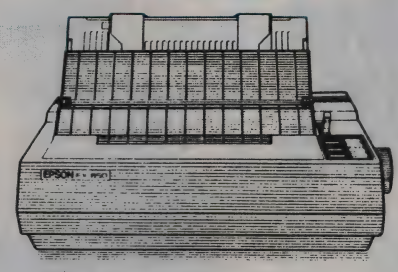
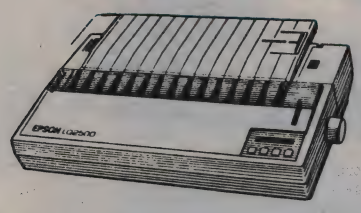


- 264 cps (12 cpi)
- 54 cps NLQ (12 cpi)

$339.95

LQ-1050



- 264 cps Draft
- 54 cps NLQ
- 9-Pin
- Friction Feed

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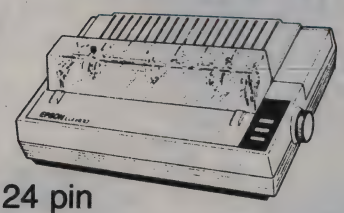

- 24 pin
- 180 cps (12 cpi)
- 60 cps NLQ (12 cpi)
- friction feed

329.95

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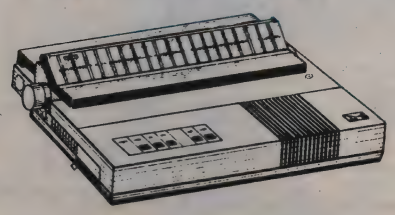
M-1109



- 100 cps Draft
- 25 cps NLQ
- 80 column
- friction feed

189.95

M1109	189.95
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M1709	$439.95
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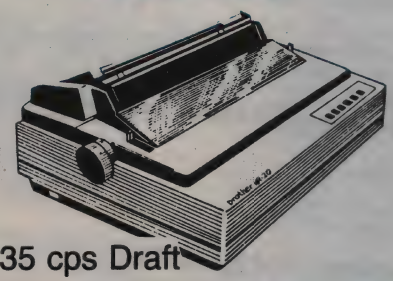
HR20	$345.95
HR40	599.95
HR60	$649.95

HR-40



- 35 cps Draft
- 136 column
- friction/tractor feed

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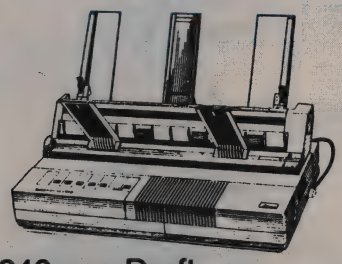
M-1709



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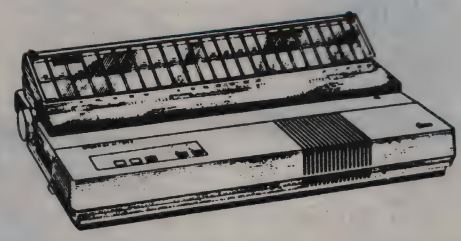

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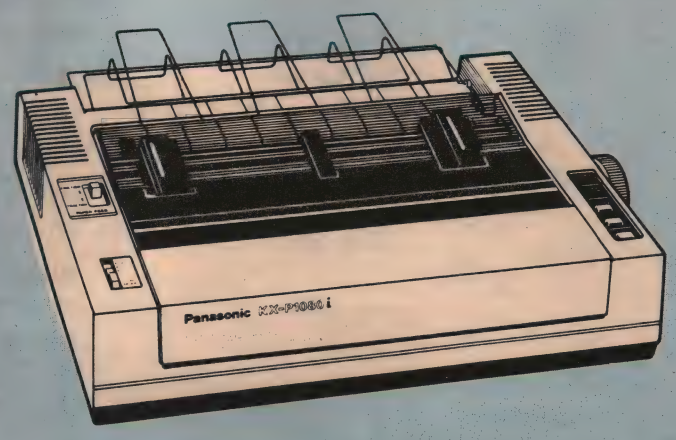

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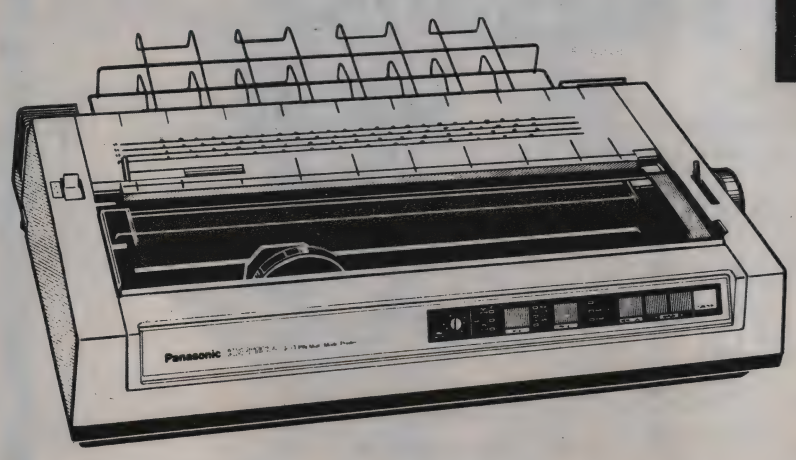

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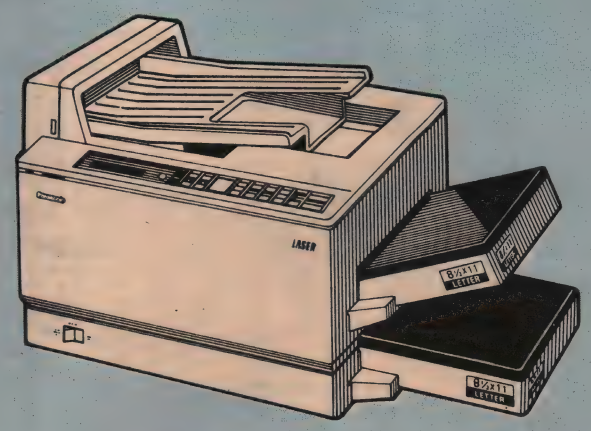

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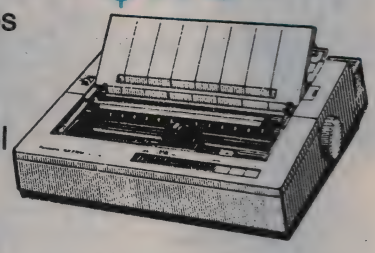

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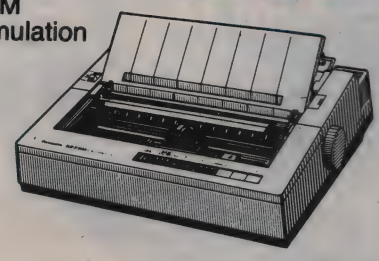

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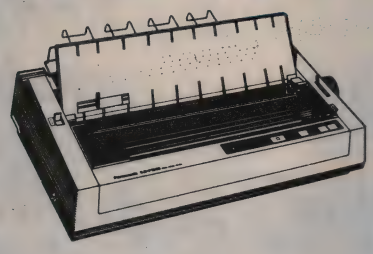

KX-P1595

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- NLQ mode
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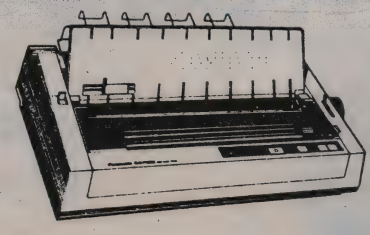

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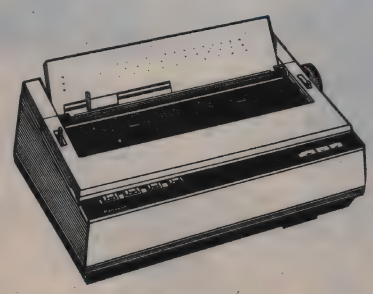

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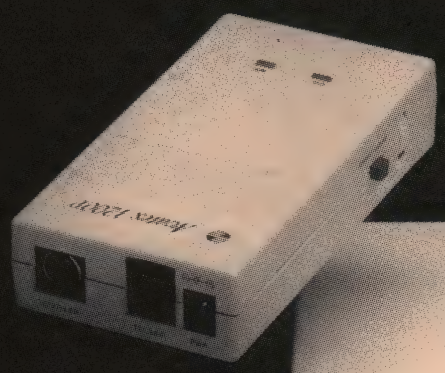

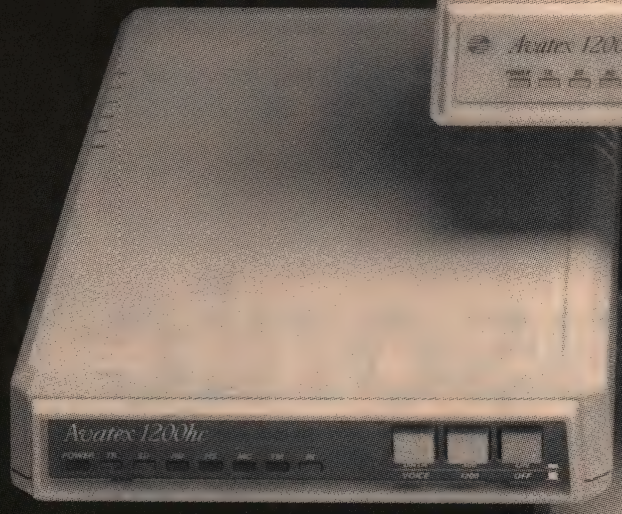

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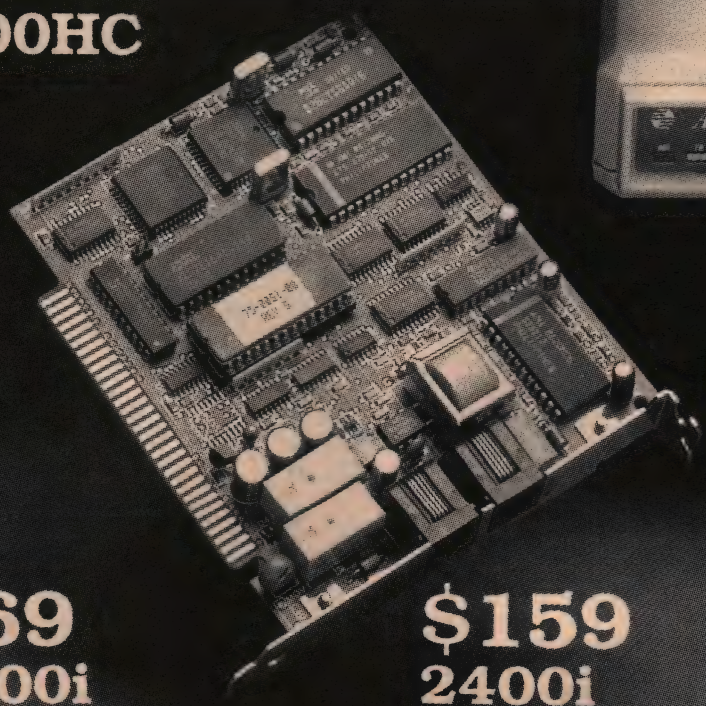

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Editorial

By Stan Veit

Who Needs "Yet Another Bus?"

One of the most useful devices ever invented for computers is the bus design. I don't know who the unsung hero was who decided that the sensible way to interconnect parts of a computer assembly was through a series of parallel connections with access at many points in the lines. He should be inscribed in history books, but he remains unknown. This was the kind of basic invention, that after it happens everyone says, "Sure, why didn't I think of that?"

About five minutes after the idea of a common open bus was invented, somebody else said; "How can I make the bus so that only my circuit boards will plug into it?"

That is the way it has been going ever since then. Half the folks have been fighting for the idea of an open bus on which everybody could interconnect their boards. The other half has been patenting proprietary buses. The first of these that I remember was the original DEC bus that connected their digital circuit cards. Next came the many IBM patents that go back about eighteen years and cover bus and other computer connections.

The personal computer industry started upon the basis of the S-100 Bus (originally called the Altair Bus). This scheme was ideal for computers where the voltage was regulated upon the individual circuit cards and which largely used static RAM. The power supplies were big enough to weld with (30 amps @ 5 volts) and the RAM took 1 amp for 16K! We went a long way with the S-100 Bus, but it was so heavy and expensive that it could never become the foundation for mass production.

Apple had their own bus for the Apple II although they opened the expansion slots up for third party peripheral boards. This gave this proprietary bus the illusion of being an "open bus" for expansion and peripheral addition purposes.

When IBM designed the bus structure for the IBM PC, they used this same scheme. The buses on the system board were part of the system design and were proprietary to IBM, however they opened the expansion slots and published the specs. The result was the massive development of third party boards, leading to the IBM PC bus becoming a de facto standard for 8088 computers.

This standard held for expansion into hard disks on the XT and for the clone revolution which saw a flood of PC/XT-type computers accomplish the dream of a computer on every desk. There was one flaw however in the lasting effect of this commonalty. The PC/XT Bus was essentially a 16-bit bus with only an 8-bit data path. This kludge design was adopted to save money on memory chips. The use of an 8-bit memory data path rather than a true 16-bit memory, reduced the cost of memory by 50%. IBM made the decision to go this route when they adapted the 8088 CPU rather than the 8086 chip. The result was so much better than anything that had come before, that we all forgot that what we had was a crippled computer.

When the IBM AT (Advanced Technology) came along with its 80286 CPU, it was time for an overhaul of the bus. The resulting AT-bus has become the true standard because it will accommodate any of the 16-bit Intel family and provides for both the 8-bit and 16-bit memory boards. Were we happy with the AT-bus? Sure. That is until the 80386 came along with 32-bits and the promise of even more powerful CPUs in the near future.

This is the point where the standards became un-standard and IBM, the source of de-facto standards diverted. They decided to return to a closed, proprietary bus called the Micro Channel which they declared would be the path of the future. The world it seems is underwhelmed by the Micro Channel Architecture (MCA) especially at the prices IBM is asking for licenses.

However, we really do need a 32-bit bus for 80386 and beyond. Compaq and a consortium of like minded companies including Tandy, Zenith, NEC, and Epson, has now specified a new 32-bit bus called the Extended Industry Standard Architecture (EISA) which they say offers features comparable to MCA. EISA they claim will be compatible with the existing AT-bus circuit boards, and will be an open bus that will not require any license fees.

This is a claim that may not be effective, simply because the new bus is based upon the IBM AT bus which IBM claims is really proprietary and toward which IBM has been tending toward tighter control.

In any event, the EISA bus needs study and consideration by the industry as a alternate to MCA. As far as we can see, the entire situation is due to IBM's desire to exert control over the industry and derive unreasonable profits from their position.

We think the MCA is a necessary attempt to provide a workable 32-bit bus for the future and it has a lot going for it. There are those who say that aside from the memory data path there is no need for a 32-bit bus, while others say full development of multi-user and multi-tasking require it.

Only time will test the need for either version of the 32-bit bus. We feel that IBM would get a lot more by making MCA available to all at a lower cost. In addition they would provide the boost for another rapid growth period for the microcomputer industry. The best way to get a bigger piece of the pie, is to make the pie bigger.

This argument should not obscure the fact that there is another family of CPUs in the running. Motorola and the 68000 family used in the Macintosh as represented by the 68020 and 68030 are very much in the race. In fact that Nubus used in Macintosh II is very important for future development and may prove to be a much more desirable path into the 32-bit world in the near future.

Computer Shopper is going to watch these new developments closely and report on them to you. We have a new columnist who is highly qualified to write about such technical subjects. He is Carl Warren, one of the industry pioneers. Carl will be reporting on technical developments and about various disk drives, back-up devices and printers in each issue. Watch for his articles and column in the next issue of *Computer Shopper*. ●

Heard On-Line

by Deep ROM

You Can't Tell The Players Without A Score Card—Let's see now, how does it go?? Microsoft announced OS/2 the same day IBM announced the PS/2 and the Extended Edition of OS/2 which IBM owns and not Microsoft who joined forces with Ashton-Tate to have its own "Extended Edition"—type system based on a product from Sybase which is jointly owned by Microsoft and Apple who is suing Microsoft and Hewlett-Packard who is part of OSF which is trying to wrest control of UNIX from AT&T and the firm it owns part of, Sun Microsystems, who owns TOPS which links Macintoshs & PCs from IBM and Compaq who doesn't use the Microchannel which is proprietary to IBM but is contained in systems manufactured by Dell, Wells American and Tandy who has a computer with a ROM-based DOS made by Microsoft who is the primary provider of software for the Macintosh made by Apple who manufacturers printers that are driven by "PostScript" which is also the screen definition language for the someday-to-be-released computer from NeXt which uses UNIX under which runs a version of Word Perfect that also runs under MSDOS and on the Apple II and Macintosh. If this is war, we wonder what the truce will be like!

Our Bozo Of The Decade Award Goes To Judge Harold H. Greene—For those who have forgotten, he's the jurist who wrote the decision that required the breakup of the Bell System, a decision that was supposed to restore democratic practices to business and bring untold benefits to consumers everywhere. Well, it's over four years since the January 1, 1984 ruling and the benefits are still untold!! Service has deteriorated all over the country, consumers don't know where AT&T stops and New England Bell starts, we are besieged nationwide with cheap non-Bell pay phones that take twice as long to make credit card calls and often don't generate the proper tones to pick up answering machine messages (while they have the audacity to tell you "Thank you for using Blutto Telephone Service" as though you wouldn't walk five miles to use a Bell phone if you only knew where to find one!); maybe MCI & Sprint love it but the general public has been ill-served.

Additionally, one of the benefits to both the public and AT&T of the divestiture was supposed to be the fact that AT&T, now that it was no longer a monopoly, could enter the computer business and, with its proven technological and manufacturing expertise, create further competition in that field. We all know how that has worked out—Products by Olivetti & Convergent; Mis-Marketing by AT&T!! (Question—Does AT&T's investment in Sun mean that that company is doomed?? Stay tuned.)

Just a further example of the age old truism (first stated by Moses to his brother Aaron): If it's not broken, don't fix it!

Big Grey Cuts Them Loose (With Class) But Loses Some Big Fish—As readers of the business press know by now, IBM has been going through the throws of a massive internal reorganization; a reorganization intended to create a leaner & hungrier IBM by consolidating manufacturing, greatly reducing its middle management strata and eliminating many staff functions. In spite of its desire to dramatically pare down its staff, IBM has attempted to make the impact on displaced persons as painless as possible by offering most of the affected employees the choice of a transfer or a marvelous severance package, often including two years pay (the only employees not to be offered the choice are those who have "indispensable skills" that the company wishes to retain. They, supposedly, will be offered only transfers. Sounds to old ROM as though the door could open here on lawsuits from "indispensables" who would rather take the money and head to the beach like many of their co-workers).

Alas, for IBM things are not going as well as was hoped when the reorganization was conceived. It has been slow going in many management areas such as Atlanta and White Plains—and the longer it draws out, the more uncertainty abounds and the lower morale gets. Managers are afraid to commit to new projects they may not be around to finish, employees and their spouses are reluctant to make personal commitments in communities they

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COMDEX '88 Preview
continued from page 117

Models 60, 80 and AT-class machines. The list price for the PhD145-E (145MB) is $2495, the PhD330-E (330MB) has a list price of $4295. For AT-class machines and compatibles (286 & 386) the PhD145 lists at $2495 and the PhD330-E/PC has a suggested list of $4295. Both series of products can be seen at the Procome Technology Booth #H6.

Tecmar Introduces Quality Tape Family

The Techmar booth will feature the new QT-150, 150MB portable tape backup system and the new QT-40i/PS low cost 40MB internal tape drive for the PS/2.

The external QT-150 is priced at $2495, while the internal half-height version carries a suggested retail price of $2095. The systems include Tecmar's powerful QTOS software and can be ordered with interface adaptors for the IBM PC/AT bus or for the MicroChannel architecture of the IBM PS/2.

The QT-40i/PS is a 3.5" form factor and uses a floppy interface to simplify integration. An external model the QT-40e can also be used with the IBM personal computer line and compatibles. Pricing for the QT-40i/PS and 40e/PS is $595 and $795, respectively. For additional information visit the Tecmar Booth.

Printers, Plotters And Scanners... Color, Laser And Supplies

Arkwright, Inc. New Transparent Laser Film

Arkwright will exhibit its overhead transparency film for laser printers. Booth W122.

Goldstar 1220W VGA Analog Monitor.

Computer Peripherals Unveils Seven New HP Fonts

Computer Peripherals will display their new low cost JetFont line of extended capability font cartridges for Hewlett-Packard laserjet printers with the introduction of seven new fonts. Booth W994.

Hitachi New Low Cost Plotters

Hitachi will introduce a lower-cost, more rugged version of its A through D size plotter. Booth 1258.

Okidata Two New 9-Pin And 24-Pin Printers

Okidata's Microline will introduce the Microline 320 & 321. Both are nine pin printers designed for reliability and paper handling for PC and workstation environments. Okidata will also

continued on page 461

Heard On-Line
continued from page 169

may soon no longer be a part of and there is a general depression or confusion throughout many parts of the organization.

To add to these problems, a number of high profile executives have left the organization to join hardware or software competitors (most notably Frank King to Lotus and Don Casey to Apple). These moves may or may not have been anticipated or even desired by IBM—that is not known publicly. What is, however, perceived by the public is a loss of key personnel whose presence within IBM seemed positive.

It's not often that ROM feels sorry for Big Gray but it seems here that the firm tried to behave more than responsibly and is getting burned for it. Unfortunate!

Apple recently announced a reorganization which analysts feel will make it more competitive with Big Gray. Obviously there won't be the same displacement within Apple as within IBM but there will be the same bruising of egos and trampling of ambitions. Will Apple sail through it without losing some stars? Only time will tell!

Convergent Gets Gobbled—Speaking of reorganizations, employees of Convergent Technologies recently found that they would be going through the most disconcerting type—acquisition by a much larger parent, UNISYS; the type that always results in consolidations and layoffs.

Convergent was founded at approximately the same time as two other firms who planned to make the same type of high-end micro, Fortune & Victor, and each firm charted its own marketing direction. Fortune sought its own fortune through a distribution built around independent retailers, Victor planned on selling through office machine & supply firms as well as by direct corporate contacts and Convergent decided to sell only on an OEM basis and rapidly hammered out agreements with such well-known firms as AT&T and Burroughs to produce systems for marketing under the AT&T and Burroughs names.

The Convergent strategy seemed to be the most successful for a few years (particularly as Fortune & Victor eventually headed for the bankruptcy courts) but recently things have hit a downturn. The relationship with AT&T went sour and was ended and Burroughs (now UNISYS), in its own words, acquired Convergent to "protect its source of supply." Now, as with IBM & Apple, industry watchers wait to see who is left in place when the dust settles (Convergent's founder, Alan Michaels, has long been gone from the firm and is the founder of the relatively new Ardent firm).

So What Does It All Mean??—Firms, even the biggest, layoff, merge, fold, engage in interlocking agreements, fail and, yes, even sometimes succeed. The computer industry is just like any other in its types of business activities; its rapid technological changes and short product life cycles do, however, accelerate and magnify all of these occurrences. It's a lot of fun—unless you're caught in the middle! ●

The First Comdex
continued from page 117

now realized that Comdex was their show rather than the mainframe conferences or hobbyist Faires. They responded by attending and pushing the business uses of their products. Apple Computer was there showing the use of Apple with Visi-Calc. Tandy exhibited their TRS-80 Model II business computer which they were selling through ISOs for the first time. Zenith Data Systems, Northstar, Alpha Micro Systems, Commodore Business Machines, Hewlett Packard, Texas Instrument and almost all the other major players in the microcomputer industry made this show. IBM was also exhibiting although this was before the introduction of the PC.

The talks and seminars were extensive and covered topics of interest to the ISOs. In addition the industry members were starting to talk to each other and discussing the topic of interest to all. "Where is this mushrooming industry going?" Such Gurus as Adam Osborne, who had not yet joined the ranks of manufacturers and Bill Gates of Microsoft, who did not yet dominate the software industry, tried to predict the future.

Since this is part of Stan Veit's History, I must relate why this 1980 Comdex is so deeply impressed in my memory. I had come out to Las Vegas for the first time to help my friend John French in his booth. I realize now that John really didn't need the help, but he was concerned about me, since I had been depressed after closing my computer store.

Sheldon Adleson: Founder of COMDEX

I was staying at the Landmark Hotel right across from the Convention Center and I was on one of the upper floors from which all of the Strip was visible. The show was very impressive because it was like having our entire industry under one roof. I had also made contacts which were to keep me in the business over the next few years both as a writer and consultant.

On Thursday, November 22, I awoke, turned on the TV and drew the drapes so I could enjoy the sight of the Las Vegas Strip. As I headed for the bathroom to shower, an announcer was saying that there was a small fire in the kitchen of the MGM Grand but it was under control. I could not have been in the bathroom showering and shaving, much more than fifteen minutes, but when I emerged I could see flames and clouds of black smoke coming out of the MGM Grand and there were people on the roof. I dressed quickly and continued to watch. The helicopters were picking up people off the roof of the Grand and taking them to the Convention Center parking lot beneath me. I felt helpless in the face of this emergency, but I rushed over to the Convention Center to see if I could do anything to help. Other staffers were coming in, dressed in tee-shirts and jeans, everyone wanted to help. The Las Vegas authorities took over the vacant East Hall of the Center as a staging area for the arriving Grand people. One of the computer manufacturers brought over computers and set them up as databases in support of Red Cross efforts to locate people. This was to be one of the first applications of the PC in an emergency situation.

The show was effectively over for that year and I made my way out to the airport to come home. It was there I met some friends from New York at the departing gate. They looked terrible, Bob DeAngelo in particular was always a sharp dresser and here he was in ill-fitting clothes. Then they told me that they had been at the MGM Grand and lost everything except their lives. The clothes had been provided by the Red Cross and they were grateful for anything.

I will never forget the 1980 Las Vegas Comdex, although until I researched this piece, I always thought it was the first Comdex show. Sometimes an event can impress you so deeply that you forget what came before.

Fall Comdex 1988

This November Comdex in Las Vegas celebrates its tenth anniversary and it will occupy all of the Convention Center including the West Hall which was not even built in 1980. In addition it will be held at nine other locations in hotels throughout the Strip. Over 100,000 people will try to see the show being moved between venues by buses. They won't make it, because it is impossible to see everything, everywhere. It is simply too much. This is the sign of a growing vital industry that still has not found its bounds. The computer industry has become worldwide and Comdex Las Vegas is its major exhibition. No matter that you can't see it all. Its worth the effort. ●

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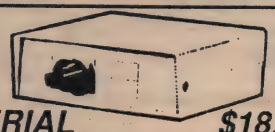

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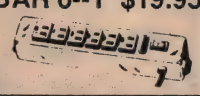

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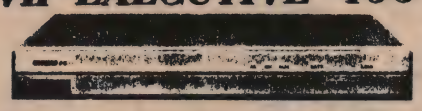

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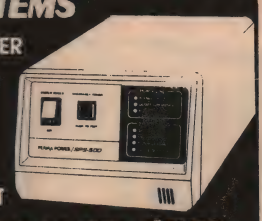

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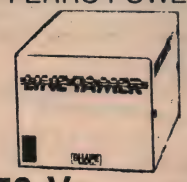

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Regulation ≠3%

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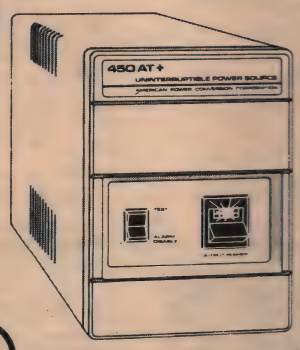

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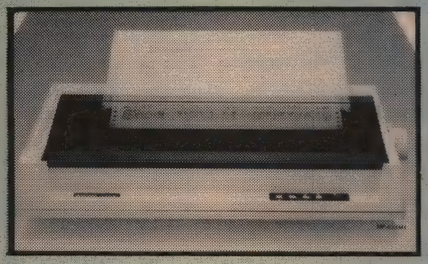

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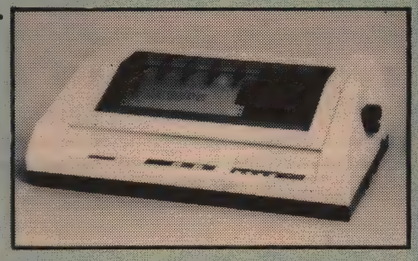

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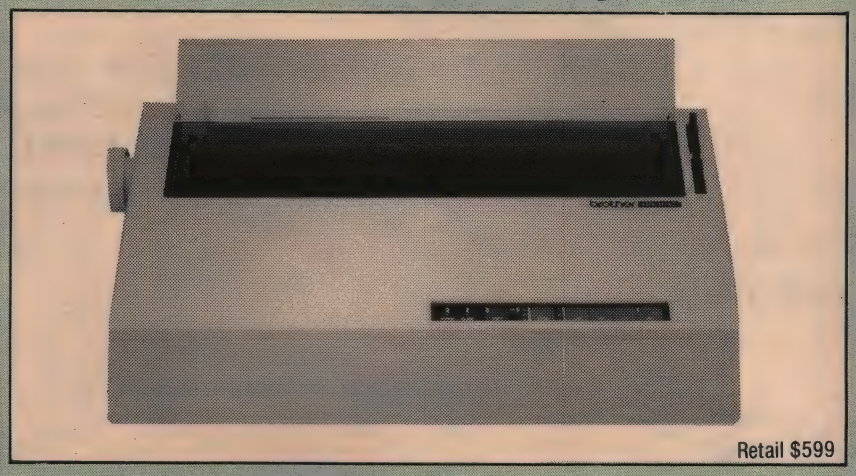

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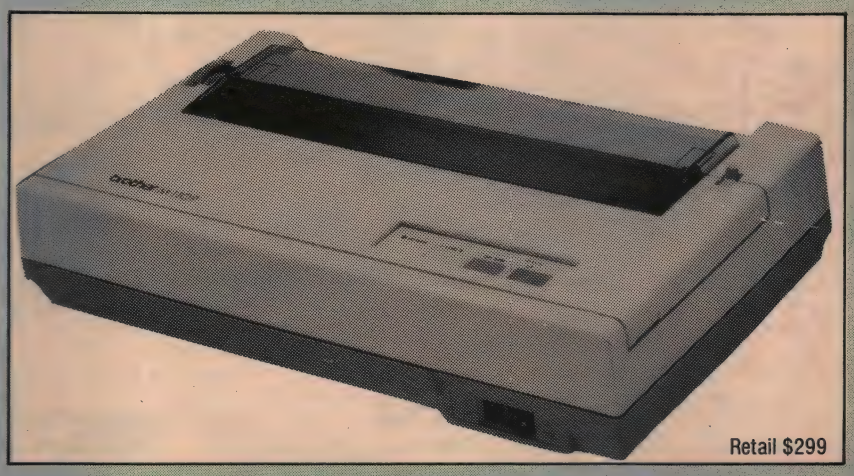

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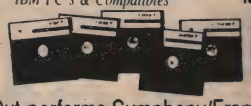

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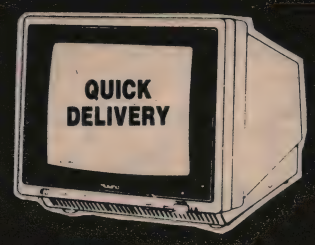

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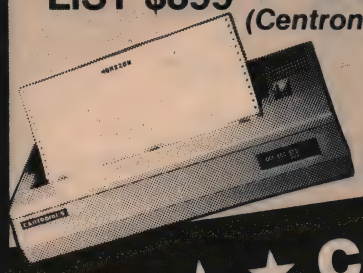

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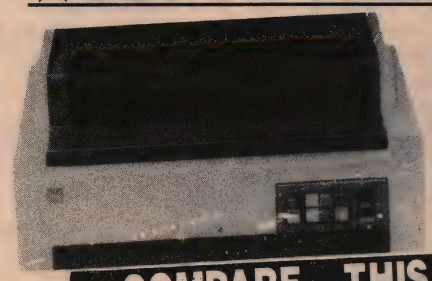

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- NORTON RATING (V.4) 18.7
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- COMPLETE DOCUMENTATION
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- 8088 (Switchable 4.77/10 MHz)
- 640k Motherboard
- 1-360k Disk Drive
- Serial, Parallel, & Game Ports
- 84 Key Keyboard w/Click
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- 80286 (Switchable 6/10 MHz)
- 1 MB Motherboard
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- 102 Key Keyboard
- 1-Year Factory Warranty

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With Mono Card & Mono Monitor
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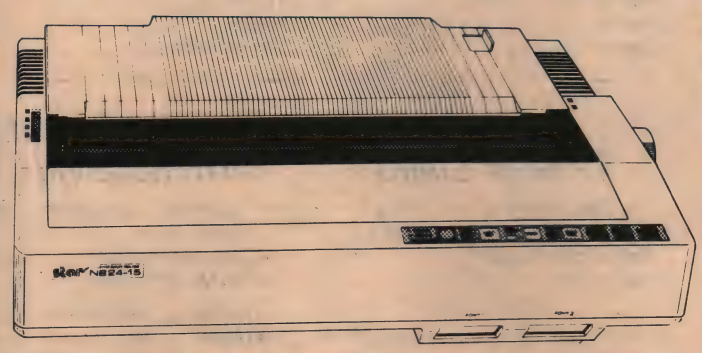
NX-1000



- 144 CPS DRAFT
- 36 CPS NLQ
- FRICTION & TRACTOR

$165

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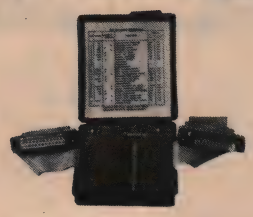


- Monitor RS232 Signals With Twelve Dual-Color Led's
- Twenty-Four Dip Switches For Enabling/Disabling Signal Lines
- No External Power Required
- Contains Jumper Wires To Reconfigure Signal Path

#78680 . . . . . **$44.80**

MICRO TESTER

- Monitor All 25 Signal Lines
- Red And Green LED's Indicate Signal Levels
- DB25 Male To Female

#38930 . . . . . **$36.85**

PC TOOL KIT

- This Kit Includes All Of The Tools You Need To Repair, Upgrade, And Maintain Your Computer
- Attractive Zippered Carrying Case

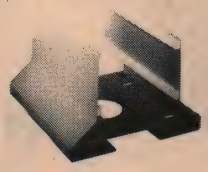
#38935 . . . . . **$27.80**

UNIVERSAL CABLE

- This Cable Will Always Plug In Regardless Of Gender
- DB25 Male And DB25 Female Connector On Each End
- All 25 Lines Passed Straight Through

#38370 . . . . . **$17.80**

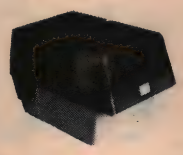
VERTICAL CPU STAND



- Position CPU Vertically Alongside Desk
- Adjustable To Hold CPU's From 3¼" to 6¼"
- Sturdy Steel Construction
- Beige Color

#38660 . . . . . **$27.65**

DISKETTE STORAGE CASES



- Flip-Top Filing System With Snap Lock Lid
- Anti-Static
- Organize Disk With Five Dividers

#38755 . . . . . 3½ 40 DISK . . . . . **$ 8.95**
#78665 . . . . . 5¼ 70 DISK . . . . . **$ 8.95**
#38465 . . . . . 5¼ 70 DISK/With Lock **$10.85**

UNIVERSAL PRINTER STAND

- Two Pieces Adjust To Any Size
- Accoustic Damper Pads Reduce Noise And Vibration
- Beige Color

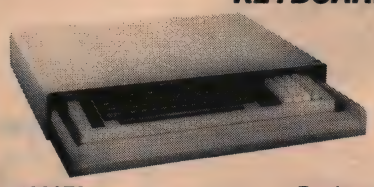
#78670 . . . . . **$9.95**

PRINTER STAND WITH RECEIVING TRAY

- Polyester-Coated Steel Frame Construction
- Easy Access For Paper Handling
- Fits Most Printers

#78655 . . . 80 Column **$24.50**
#78660 . . . 132 Column **$27.95**

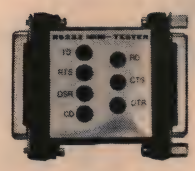
KEYBOARD DRAWER



- Drawer Has Ball Bearing Slides
- Locks Into Open Position
- Fits XT Type or AT Type Keyboards

#38670 . . . . . Desktop (Metal) **$58.45**
#38375 . . . . . Under-Carriage **$38.60**
#38380 . . . . . Wooden (Oak) **$58.45**

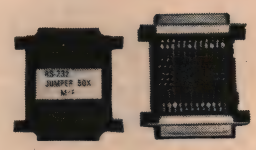
RS232 MINI TESTER



- Monitor The Status Of TD, RD, RTS, CTS, DSR, DTR, CD
- All 25 Connectors Wired Through
- DB25 Male To DB25 Female

#38685 . . . . . **$10.95**

JUMPER BOX



- Solder Type
- Make Custom Wiring Configurations
- Comes Complete With 25 Jumper Wires
- DB25 Connectors

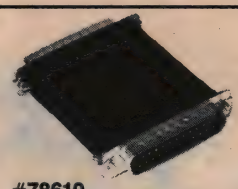
#78645 . . . . . Male to Female **$7.85**
#38740 . . . . . Male to Male **$7.85**
#38940 . . . . . Female to Female **$7.85**

SOLDERLESS JUMPER BOX

- No Soldering Required Just Insert Wire Into Socket
- Comes Complete With 25 Jumper Wires
- DB25 Connectors

#38745 . . . . . Male to Female **$9.65**

NULL MODEM



- Allows Two Computers To Communicate Without The Use Of A Modem
- DB 25 Connectors

#78610 . . . . . Male to Female **$6.95**
#38385 . . . . . Female to Female **$6.95**

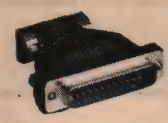
GENDER CHANGERS

DB9 PIN
#38310 Male to Male **$4.25**
#38315 Female to Female . . . **$4.25**

DB25 PIN
#38620 Male to Male **$5.95**
#38625 Female to Female . . **$5.95**

CENTRONIC (36 PIN)
#38730 Male to Male **$8.95**
#38735 Female to Female . . **$8.95**

AT GENDER CHANGER



- DB9 Female to DB25 Male

#38390 . . . . . **$6.85**

POWER STRIPS

- Six Outlets
- 15 AMP Circuit Breaker With Reset
- Beige Color

#78650 . . . . . **$9.95**
#38135 . . Surge Protected . **$18.75**
#38470 . . Surge/EMI/RFI . . **$23.85**

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- Can Be Used On Single Or Double Sided Drives
- Can Be Used Up To Fifteen Times
- Contains One Cleaning Diskette And One Bottle Of Cleaning Fluid

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#38675 . . . . . 5¼ DISK **$3.75**

MODEM PROTECTOR

- Protect Your Modem From Spikes & Surges On The Telephone Line
- RJ11 Connections

#38395 . . . . . **$12.95**

SPIKE PROTECTOR

- Helps Protect Electronic Equipment From Transient Spikes
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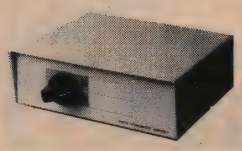
DATA SWITCHES



- High Quality Rotary Switch
- All Pins Switched
- Fully Shielded
- Female Connectors
- Six-Month Limited Warranty

TWO POSITION (AB Type)

#38610	DB 25 Pin	$27.95
#38640	Centronics 36 Pin	$28.95
#38700	DB 9 Pin	$34.50
#38325	DB 37 Pin	$49.65
#38460	DB 15 Pin	$36.80
#38612	8 Pin Mini Din (MAC)	$39.50

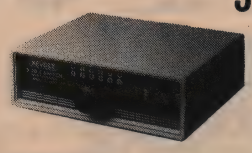
FOUR POSITION (ABCD Type)

#38615	DB 25 Pin	$39.95
#38695	Centronics 36 Pin	$41.95
#38618	DB9	$49.65
#38445	8 Pin Mini Din (MAC)	$49.65

CROSSOVER (X-Type)

#38650	DB 25 Pin	$43.50
#38655	Centronics 36 Pin	$45.95
#38440	DB9 Pin	$49.55

3 TO 2 DATA SWITCH



- Allows Use Of Three Input Devices And Two Output Devices or Vice Versa

#38330 . . . . . DB 25 Pin $69.85

CABLES

DB25 Pin Male to DB25 Pin Male

#78640	3 ft	$ 6.85
#38605	6 ft	$ 7.95
#78620	10 ft	$ 9.95
#38025	15 ft	$14.90

DB25 Pin Male to DB25 Pin Female

#38630	6 ft	$ 7.95
#78625	10 ft	$ 9.95
#38060	15 ft	$14.90

Centronics 36 Pin Male to 36 Pin Male

#38680	6 ft	$ 8.95
#78685	10 ft	$10.95
#38095	15 ft	$18.65

Centronics 36 Pin Male to 36 Pin Female

#38665	6 ft	$ 8.95
#78695	10 ft	$10.95
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PC Printer (DB25 Pin Male to Centronics 36 Pin Male)

#38645	6 ft	$ 8.95
#78630	10 ft	$10.95
#38715	15 ft	$16.95
#38005	25 ft	$24.90

Right Angle Printer

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#38751	1 ft	$ 6.85
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#98605	6 ft	$10.95

DB9 Pin Male to DB9 Pin Male (Monitor)

#38210	6 ft	$ 8.90
#38215	10 ft	$12.85

DB9 Pin Male to DB9 Pin Female (Monitor Extension)

#38230	6 ft	$ 8.90
#38235	10 ft	$12.85

- We also stock many Apple cables.
- Please call for longer length or custom cables.

KEYBOARD EXTENSION

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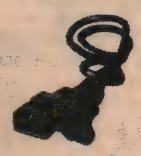
#38400 . . . . 12 ft $6.35

MONITOR POWER EXTENSION

#38220 . . . . 6 ft $5.65

MONITOR POWER ADAPTER



#38335 . . . . 3 ft $4.90

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#38340 . . . . 10 ft $4.90

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- Lifetime Warranty
- 100% Certified Error Free

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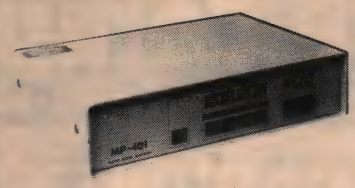
5¼" Double Side Double Density . . $ 9.65

#39040
5¼" Double Side High Density . . $17.50

#39045
3½" Double Side Double Density . . $19.50

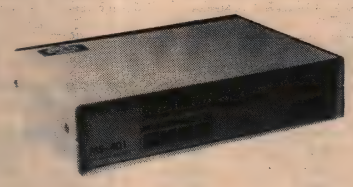
PARALLEL SMART SWITCH



- Automatic Data Switch Which Allows Multiple Computers To Output To One Printer
- Selectable Auto/Manual Operation
- Scans Inputs Every 10 Milliseconds
- Female DB25 Connectors

#38710 . . . . . 4 to 1 . . . . $138.55
#38760 . . . . . 8 to 1 . . . . $188.85

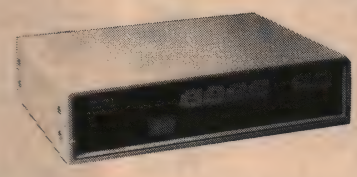
SERIAL SMART SWITCH



- The Dalco Serial Smart Switch Offers A Low Cost Way For Multiple Computers To Share A Serial Printer
- No Special Software Required
- Selectable Auto/Manual Modes Of Operation
- Female DB25 Connectors

#38711 . . . . . 4 to 1 . . . . $158.85
#38761 . . . . . 8 to 1 . . . . $208.85

SMART SWITCH (4 to 2) WITH BUFFER



- Share Two Printers From Four Computers
- Also Includes Built-In 256K Buffer With Multiple Copy Feature
- Alphanumeric Display
- Autoscan Or Manual Mode
- Parallel Inputs And Outputs

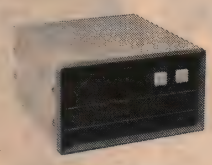
#38345 . . . . . $324.55

SMART SWITCH (6 to 4) WITH BUFFER

- Share Up To Four Printers From Up To Six Computers
- Software Or Manual Control
- 256K Buffer Expandable To 512K
- Parallel Inputs And Outputs

#38350 . . . . 256K $416.67
#38430 . . . . 512K $468.65

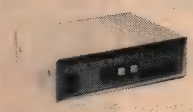
SERIAL PRINT BUFFER



- Supports RS232 Or Xon/Xoff
- Make Up To 99 Copies With The Copy Feature
- Alphanumeric Display
- Female DB25 Connectors

#38355 . . . . . 256K $287.35

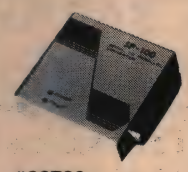
PARALLEL PRINT BUFFER



- Includes Multiple Copy Function
- LED Display
- Female Centronics (36 Pin) Connectors
- Heavy-Duty Metal Case
- Beige Color

#38635	64K	$ 98.50
#38420	64K with AB Switch	$119.80
#38705	256K	$189.50
#38435	256K with AB Switch	$209.50

INTERFACE CONVERTER



- Convert What You Have To What You Need
- Baud Rate Selectable
- DTE Or DCE Selectable

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COMPAQ PORTABLE III MODEL 20	(640K, 1.2MB, 20MB)	$CALL
COMPAQ PORTABLE III MODEL 40	(640K, 1.2MB, 40MB)	$CALL
COMPAQ PORTABLE 386 MODEL 40	(1MB, 1.2MB, 40MB)	$CALL
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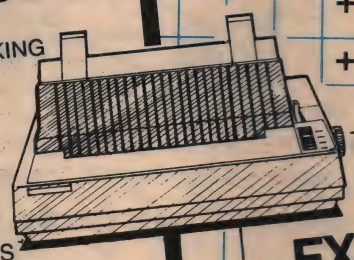

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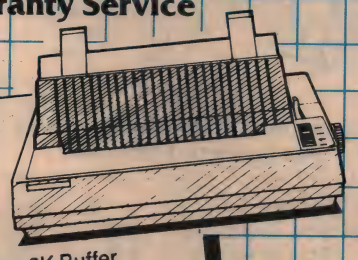

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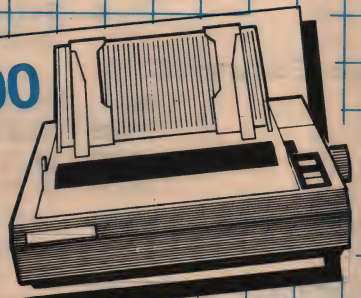

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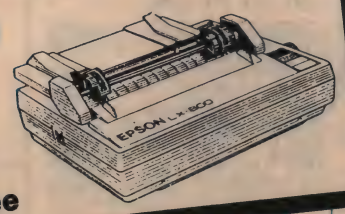

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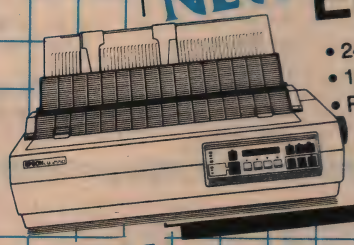

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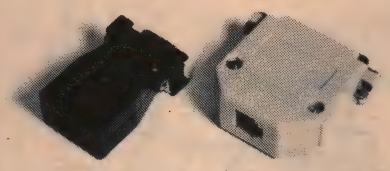
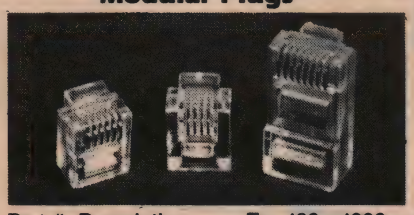
Modular Adapter Kits



Use these modular adapter kits to turn D-Sub ports to 6 or 8 pin modular jacks.

Part#	Description	Ea.	50+	100+
K9M-6	9 pin male to 6 pin	2.43	1.89	1.70
K9F-6	9 pin female to 6 pin	2.57	2.00	1.80
K9M-8	9 pin male to 8 pin	3.14	2.44	2.20
K9F-8	9 pin female to 8 pin	3.43	2.67	2.40
K25M-6	25 pin male to 6 pin	2.43	1.89	1.70
K25F-6	25 pin female to 6 pin	2.57	2.00	1.80
K25M-8	25 pin male to 8 pin	3.14	2.44	2.20
K25F-8	25 pin female to 8 pin	3.43	2.67	2.40

Modular Plugs



Part #	Description	Ea.	100+	1000+
MP-4	4 pin plug	.20	.15	.11
MP-6	6 pin plug	.25	.18	.14
MP-8	8 pin plug	.30	.22	.17

Modular Wire

Part #	Description	Per ft.	100 ft.	1000 ft.
MW-4	4 conductor	.10	5.00	40.00
MW-6	6 conductor	.15	8.00	65.00
MW-8	8 conductor	.20	10.00	83.00

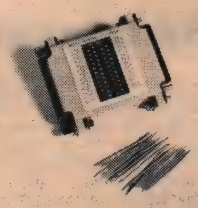
Modular Crimping Tool

Part#	Description	Ea.
MCT-06	Crimps 4 and 6 pin modular plugs	12.50
MCT-08	Crimps 8 pin modular plugs	22.50

RS-232 BREAK-OUT BOX

Pocket sized-for circuit testing, monitoring and patching.

Model#	Ea.	10+
BRB-232	39.95	35.00

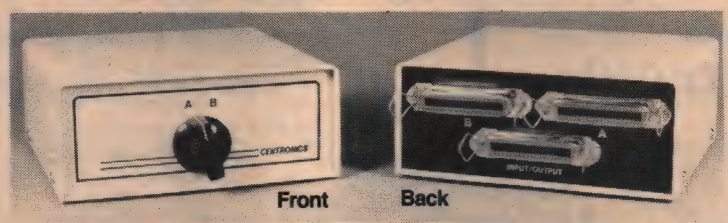


RS-232 MINI-WIRING DEVICE

Solderless-allows user to configurate any type of RS-232 or DB-25 circuits using jumpers.

Model#	Ea.	10+
MWD-232	8.95	7.00

Switchboxes



Front Back

• Heavy Metal Case • Rotary Switch Construction • Beige Enamel Finish • Gold Plated Contacts

DB-25 Female Connectors

Model #	Description		Ea.	10+
SB25-2	2 Way	25 Line	20.00	18.00
SB25-3	3 Way	25 Line	26.00	23.00
SB25-4	4 Way	25 Line	29.00	25.00
SB25-5	5 Way	25 Line	39.00	34.00
SB25-X	Crossover	25 Line	30.00	26.00

Centronics Female Connections

Model #	Description		Ea.	10+
SB36-2	2 Way	36 Line	24.00	22.00
SB36-3	3 Way	36 Line	30.00	26.00
SB36-4	4 Way	36 Line	35.00	30.00
SB36-5	5 Way	36 Line	45.00	39.00
SB36-X	Crossover	36 Line	38.00	33.00

DE-9 Female Connections

Model #	Description		Ea.	10+
SB9-2	2 Way	9 Line	20.00	18.00
SB9-4	4 Way	9 Line	35.00	30.00

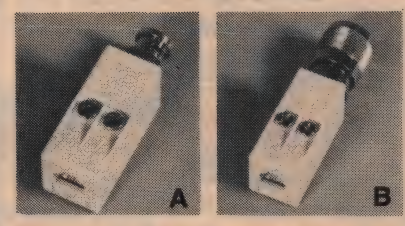
DA-15 Female Connections

Model #	Description		Ea.	10+
SB15-2	2 Way	15 Line	24.00	20.00

DC-37 Female Connections

Model #	Description		Ea.	10+
SB37-2	2 Way	37 Line	25.00	23.00

Coaxial Baluns



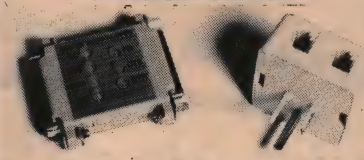
These baluns have both screw terminals and RJ-11 jack built in to each unit.

Part#	Description	Ea.	10+	50+
(A.)BL-01	BNC Balun	9.95	8.50	7.00
(B.)BL-05	Twinax Balun	19.95	16.00	14.00

Gender Changers

Model #	Description	Ea.	10+
GC-9M	9 pin male to male	4.50	3.75
GC-9F	9 pin female to female	4.50	3.75
GC-25M	25 pin male to male	4.95	4.00
GC-25F	25 pin female to female	4.95	4.00
GC-36M	36 pin male to male	6.50	5.50
GC-36F	36 pin female to female	7.00	6.00

Problem Solvers



Model #	Description	Ea.	10+
MWD-232	RS-232 mini wiring device	8.95	7.00
MT-232	RS-232 mini tester	8.95	7.00
SP-232	RS-232 surge protector	8.95	7.00
BRB-232	RS-232 breakout box	39.95	35.00
MSP-232	Modem surge protector	12.95	10.00

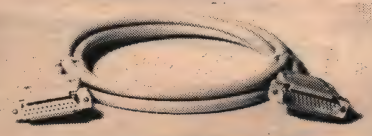
Cable Assemblies

Parallel Printer Cables

PC/AT and compatibles

Model #	Description	Ea.	10+
PC301-6	6 foot	7.00	6.00
PC301-10	10 foot	8.00	7.00
PC301-15	15 foot	12.25	10.00
PC301-25	25 foot	18.50	15.00

DB-25 Cables



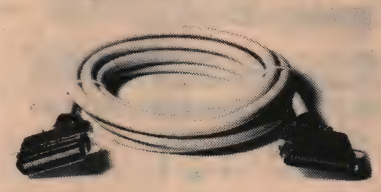
male to male all lines wired

Model #	Description	Ea.	10+
25MM-6	6 foot	7.00	6.00
25MM-10	10 foot	8.00	7.00
25MM-25	25 foot	18.00	16.00
25MM-50	50 foot	34.00	30.00
25MM-100	100 foot	63.00	56.00

male to female all lines wired

Model #	Description	Ea.	10+
25MF-6	6 foot	7.00	6.00
25MF-10	10 foot	8.00	7.00
25MF-25	25 foot	18.00	16.00
25MF-50	50 foot	34.00	30.00
25MF-100	100 foot	63.00	56.00

Centronics Cables



male to male

Model #	Description	Ea.	10+
36MM-6	6 foot	8.00	7.00
36MM-10	10 foot	10.00	9.00

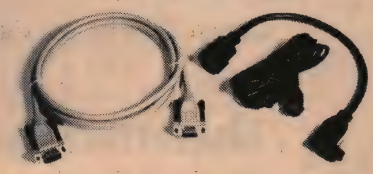
Apple Cable Assemblies

Model #	Description	Ea.	10+
AC-1	MAC to IMAGE II	8.95	6.00
AC-2	IIe to IMAGE II	8.95	6.00
AC-3	IIc to IMAGE II	8.95	6.00
AC-4	MAC+ to IMAGE II	8.95	6.00
AC-5	MAC+ to ADAPTER	8.95	6.00
AC-6	MAC+ to MODEM	8.95	6.00
AC-7	8 PIN MINI DIN	6.95	5.00
AC-8	MAC to MODEM	8.95	6.00
SCSI-HD	MAC+ to SCSI DISK	9.95	8.00
SCSI-DC	SCSI DAISY CHAIN	11.95	9.50
SCSI-EC6	SCSI 6' EXT. CABLE	14.95	13.00

IEEE-488 Cables

Model #	Description	Ea.	10+
488-1	1 meter	39.95	35.00
488-2	2 meter	43.95	38.00
488-4	4 meter	49.95	43.00

Other Popular PC/XT Cables



Model #	Description	Ea.	10+
MEC-6	Monitor Extension	5.95	4.50
KEC-6	Keyboard Extension	3.95	2.50
RGB-6	RGB Cable	6.95	5.50
9MM-6	9 Pin Male-Male	5.95	4.50
DFC-2	Dual Floppy Cable	4.95	4.00
HDC-XT	XT Hard Drive Cable Set	4.95	3.50
HDC-AT	AT Hard Drive Cable Set	8.95	6.75
PSC-6	Power Supply Cord	3.95	3.00
PEC-6	Monitor Power Ext. Cord	5.95	4.50
PAC-6	Power Adapter Cable	4.95	4.00

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- Auto Answer mode
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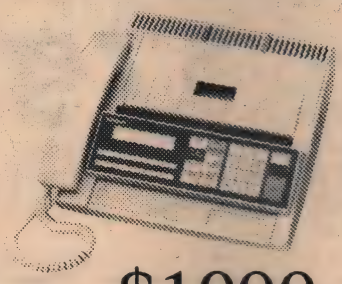
- LCD Display with Time & Date
- Automatic record keeping



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- Advanced polling
- Copier functions

MURATA

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- Advanced polling
- Copier functions
- 32 character LCD Display
- 30 number memory
- Fine mode for graphics

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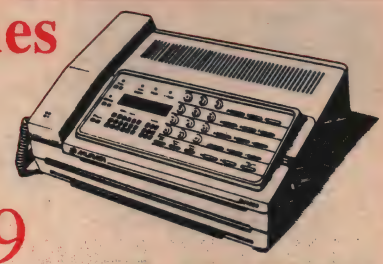

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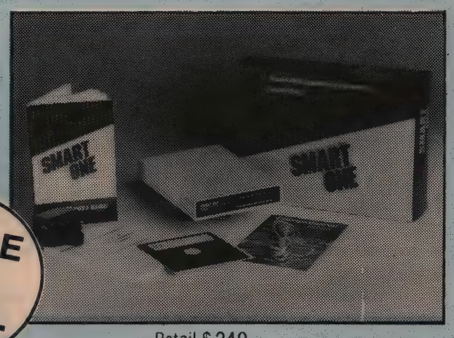

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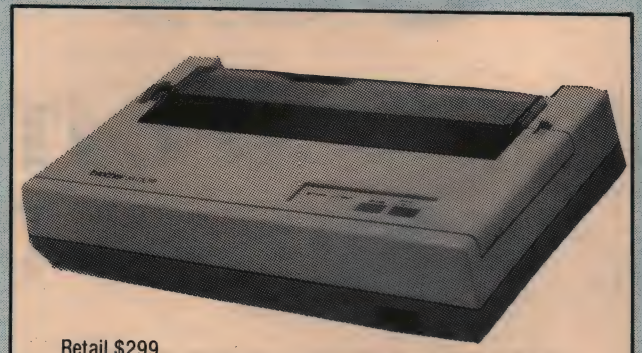
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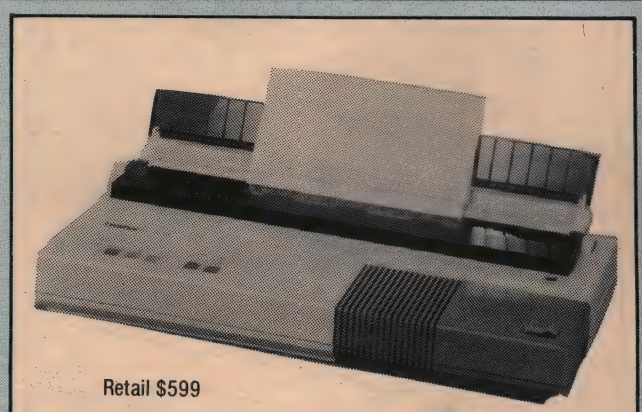
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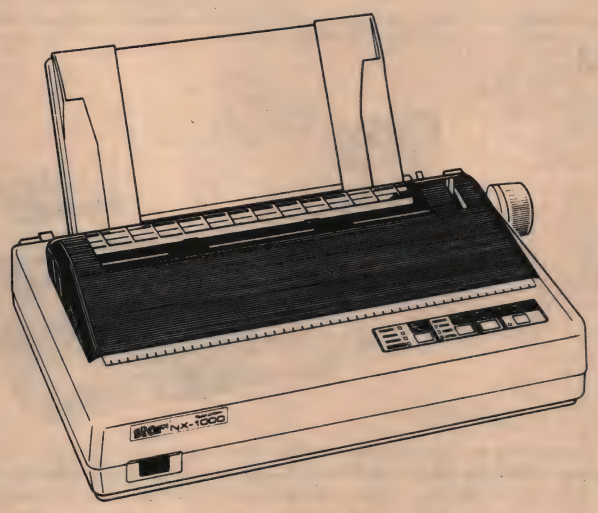

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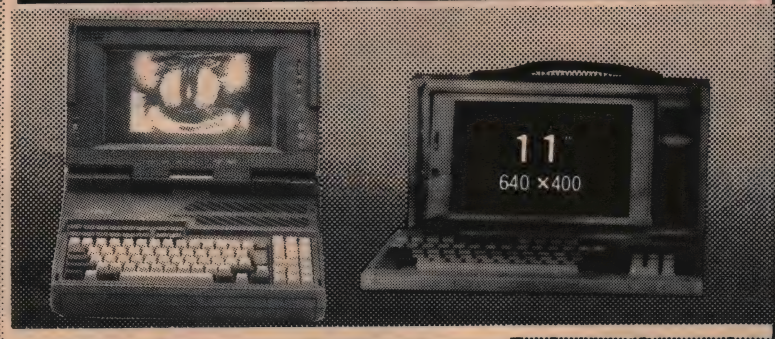

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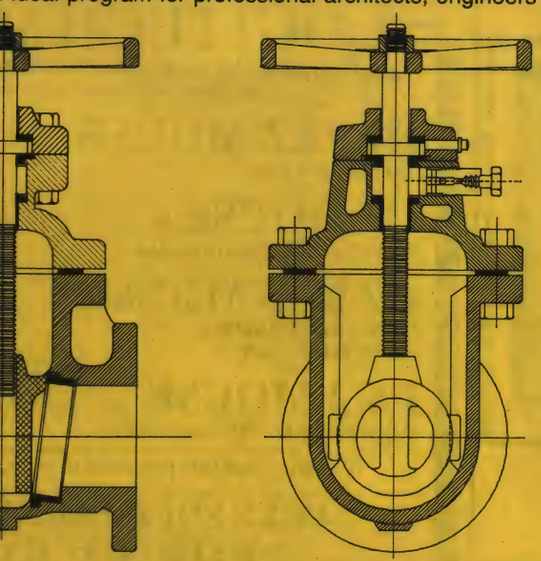

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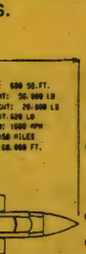

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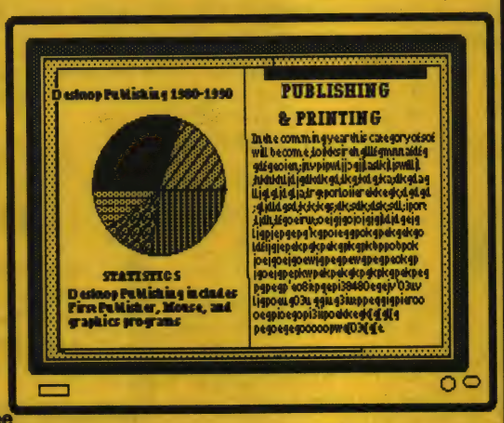

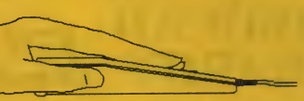

to use — pull down menus
reen selectable column layouts
low around graphics
nts and selectable point size
rt text or graphics
chrome and color supported
dreds of graphic images included free

COMBINATION SPECIALS

- First Publisher, C7 Mouse & Paintshow — **$119.95**

LOGITECH MICE

All Logitech mice are Microsoft compatible and offer optomechanical technology

HI REZ MOUSE — **$89.95**
320 dots per inch

C7 MOUSE + — **$69**
PC Magazine's editors choice

C7 BUS MOUSE — **$79.95**
Comes with 1/2 card — saves serial port

PS/2 MOUSE — **$65**
Plugs into IBM PS/2 connection

Paintshow $20 with purchase of any Logitech Mouse

FREE SOFTWARE BONUS WITH PURCHASE

POWER LOTUS 1–2–3

Turns Lotus 1–2–3 into a mouse based program complete with pull down menus. Just point and click at the Lotus menus to initiate spreadsheet commands

POPUP MENU MAKER

Lets you create popup menus on your favorite software programs, even if they were not originally designed to support a mouse.

TEXT EDITOR SOFTWARE

An extremely powerful editing program that allows 20 simultaneous windows for editing and interchange of information among word processing, data base and spreadsheet files.

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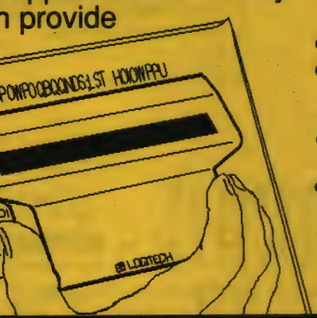
$199.95

E HAND HELD SCANNER

ocuments the communication power and
appearance that only
n provide

FREE BONUS Paintshow + with purchase of scanner



- Extremely easy to use
- Scan from photographs, newspapers, magazines, logos, books, drawings or virtually any printed graphic image
- Graphics program included allows you to enhance and edit the drawing after it is scanned
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A full fledged painting/drawing program with features better than PC Paintbrush

$39.95

Features

- Supports PCX, (Paintbrush), .TIF, & .MAC formats
- 20graphics tools & 5 hollow & filled shapes
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- Supports laser printers

UTOSYNC
ITOR

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A card, and most
s standards
SYNC COMPATIBLE
AS
graphics cards between
hz Including Hercules, CGA, EGA and VGA
nufactured guaranteed quality
alog and TTL inputs
hold controls conveniently located on front side of

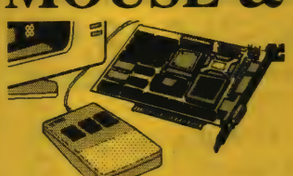
t of monitor
own default color for text oriented programs

COMBINATION SPECIALS

- Card, Bus Mouse, Autosync Monitor & Paintshow — **$629**

ULTIMATE AUTOSWITCH EGA CARD WITH LOGITECH BUS MOUSE & PAINT SHOW

$169



For less than the price of most autoswitch cards you also get a top quality mouse and a graphics program

THIS INCREDIBLE PACKAGE INCLUDES:

Ultimate Autoswitch EGA Card— 640x480

- Paradise 480 compatible
- Supports EGA, CGA, MDA, Hercules Monochrome & Variable Scan monitors and software (translation: almost everything on the market!)
- Also supports 2 modes of VGA including 640x480 in 16 colors mode
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- 132 column text mode for spreadsheets etc.
- Softswitch Automatic Mode Switching
- Bus mouse port on cartd saves serial port for other devices

PLUS

Logitech Bus Mouse & Bonus Software

PLUS

Logitech PaintShow Graphics Program

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hen it comes to trackballs, the Microspeed Fasttrap is in a class of its own."
—Computer Magazine March 1988

nlike a mouse, the FastTrap works happily on a cluttered desk, This reviewer will be ving his mouse in the drawer." *—review, PC World, March 1988*

$119.95

Bus version available — add $20

COMBINATION SPECIAL
■ Trackball & Turbo CAD— **$199**

The most fun you can have with a mouse
The Trackball offers these advantages:

- Superfast cursor movement
- Minimum deskspace required
- 100% microsoft compatible
- 200 dot per inch resolution
- Plugs into any standard serial port
- Adjustable screen velocity 50-200 plulses per in Microsoft compatible driver software
- 3 buttons — middle button can be used for drag
- functions
- Full one year manufacturer's warranty
- Made in USA
- and more — see the 2 special features!

SPECIAL FEATURE #1

map Emulator Software

am keyboard functions directly to your mouse buttons
s you to use Fasttrap even with programs that currently do not support a g device
es predefined templates for use with 1-2-3,™ dBase III,™ Wordstar,™ perfect,™ and many other programs

SPECIAL FEATURE #2

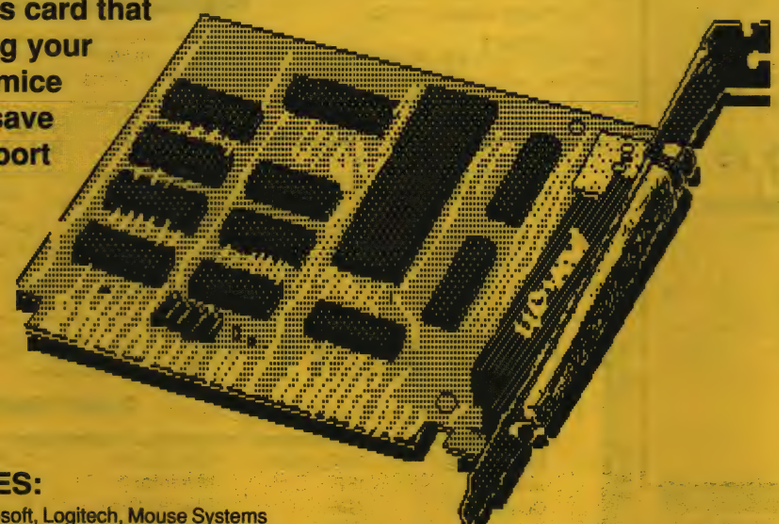
Trackwheel For Easy Access To 3D Programs

- Completely supports normal x y input of mice but adds a Trackwheel which supports z-axis movements in 3D programs such as AutoCAD 3D 2.6, DesignCAD 3D and more
- Trackwheel allows access to 3D comands without leaving drawing area to change menus or drawing modes in supportive programs

CARD

$69.95

erial mouse into a bus mouse.
s card that g your mice save port



ES:

soft, Logitech, Mouse Systems
serial mice to bus mice
32C serial devices to bus devices
me as bus mouse
ndard PC expansion slot
PC/AT, PS/2 Model 25/30
omputer
"micro-expansion" card format
ced MicroSpeed MAP pointing device driver
in support

- Includes device driver for Windows™ applications
- Includes ADI driver for AutoCAD™
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- Use in OEM applications to convert printers, plotters, modems, etc. from serial to bus devices
- 1 year warranty
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GIVE A TRACK TO YOUR MAC (OR OTHER APPLE COMPUTER)

- Replaces mice in most applications
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- Left and right button click operation
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250 Dots Per Inch Resolution
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- Lifetime warranty
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HALO III $39.95

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- nty fonts
- oint sizes
- d drawing and painting
- ed "MAC–like" program
- py, move for irregular shapes
- dot matrix and laser printers
- monochrome, CGA, EGA, VGA

tures can capture information from word processors, heets, databases and other graphics programs
onal slide show capabilities
ull range editing with expanded memory

SKTOP PUBLISHING APHICS 69.95

ly powerful graphics program which incorporates l drawing featuresof Dr. Halo III and adds features o creating graphics for desktop publishing. Works with Ventura Pagemaker and PagePerfect.

Retail $195

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- l to work with Ventura Publisher, Pagemaker, PagePerfect
- xel editing capability
- scanners and laser printers
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Produce professional documents with PagePerfect, a powerful program that integrates outstanding word processing, graphics and page layout capabilities into one easy to use program.

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- Edit text from two documents on same screen
- 2 windows for simultaneous viewing and editing
- 9 zoom levels with editing
- View a full page layout without a special monitor

Typography
- Supports over 80 typefaces from the Bitstream font library
- Bold, italic ,bold italic, underline, double underline, outline, reverse and strike out ,wide range of point sizes

System Requirements
- IBM AT, PS/2 (model 50, 60), or compatible
- 640k RAM
- IBM EGA, VGA or compat.
- Hard disk drive
- DOS 3.0 or higher

Supports
- HP Laserjet Plus & II
- Epson, Toshiba and NEC 24 pin dot matrix, Microtek 300A, Ricoh & Cannon scanners
- All major mice brands

FREE Copy of **REFLECTION** with purchase-$89.95 value
PagePerfect Includes **Desktop Publishing Graphics** Program $195 value

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File Type	Extension	File Type	Extension
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CompuServ	.GIF	PC Paintbrush	.PCX
Dr.Halo, II & III	.CUT	**Postscript**	**.PSC**
DP Graphics	.CUT	Scanner TIFF	.TIF
HP Laserjet	.HPC	Text	.TXT
InSet	.PIX	GEM Paint	.IMG
Lotus 1–23	.PIC	Microsoft Paint	.MSP

Reflecton is the ideal utility for desktop publishing. This amazing program can read and write almost all popular graphic file formats. Want to use a graphic image from another graphics program or even from a Macintosh? No problem with reflection.

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w/corded 4 button cursor	$369
w/cordless pen or cursor	$399
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w/corded 4 button cursor	$415
w/cordless pen or cursor	$449
w/corded single switch pen	$595
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- Fully solid state
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- Optical mouse — comes with optical board
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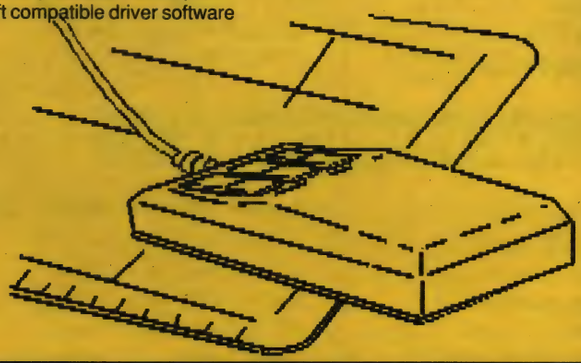

You Also Get

MENUMAKER SOFTWARE
A program that allows you to create pop-up menus on any software program regardless of whether that program was originally designed to support a mouse

MENU LIBRARY
Over 20 premade menus that let you immediately use your mouse with the most popular software programs including MS-DOS, Dbase, Lotus 1-2-3, Microsoft Word, Super Calc 3, Multiplan, Wordstar plus many more

MOUSE PAD /CUTTING BOARD
Although the Genius Dyna Mouse does not require a mouse pad, one is provided to ensure excellent precision of your mouse. The other side of the mouse pad can be used as a cutting board: it has lines to aid accuracy and rulers that can be used for measuring

MOUSE POCKET
Attaches to the side of your computer or monitor to provide a convenient place to keep your mouse when it is not being used

BONUS —

DR HALO II GRAPHICS PROGRAM FREE WTH PURCHASE
DR HALO III is a top graphics creation program. with Dr Halo you can produce professional graphics, merge graphics with text, and edit and enhance graphics created with other programs
FEATURES
- Many drawing tools including straight lines, freehand lines boxes, circles and elipses
- Fill in areas with premade or create your own patterns
- Cut copy and store any size picture
- Allow you to bring graphics from other programs such as Lotus 1-2-3 and edit and print out these graphics
- Supports Hercules, CGA, EGA and PGA
- Create and store symbols
- Freehand drawing capabilities with varioius tools
- Supports all popular printers and most plotters
- Advance printer technology with true color or grey scale
- Lasso move or cut lets you move or save irregular shaped objects
- Window support
- Slide show features lets you show a sequence of more than 200 pictures; stored in memory, timed and shown one by one automatically

NIUS 12"x12" DIGITIZING TABLET

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E/PERFORMANCE BREAKTHROUGH!

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2" drawing size
aphics MM1201 compatible and also Microsoft Mouse and PC
npatible
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- applications
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- Plugs into standard serial ports

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• ADJUSTABLE FLIP STAND FOR OPERATING COMFORT.

IUS TEMPLATE AND SOFTWARE FOR D AND OTHERS.

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CMI 5412	10mb/85ms	Ref.	115
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Brand Tech 8085	72mb/25ms	New	795
Miniscribe 6085	72mb/28ms	New	775
Micropolis 1325	72mb/28ms	New	795
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Fuji FK302-13	10mb/85ms	Unu.	125
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Tandon TM262	20mb/65ms	Ref.	195
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NEC 5126	20mb/65ms	Ref.	185
Seagate ST225	20mb/65ms	New	225
Seagate ST238RLL	30mb/65ms	New	235
Epson HMD860 RLL	30mb/65ms	Ref.	195
NEC 5146	42mb/65ms	Ref.	345
Seagate ST251	42mb/40ms	New	365
Tandon TM755	42mb/35ms	Ref.	345
CDC 92405-51	42mb/28ms	New	595
Seagate ST251-1	42mb/28ms	New	455

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Siemens Megafile 1300	275mb/28ms	New	1,495
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Mitsubishi 2860-3S	80mb	As-Is	49
Quantum Q2080	80mb	Unu.	725

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Newbury 3380S	320mb/28ms	New ☆	1,995
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Qume 842	DS	As-Is	49
Shugart 850	DS	As-Is	49

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Olivetti XM4311	360k	Unu.		69
Shugart SA455	360k	Unu.		69
Teac FD55	360k	Unu.		79
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Tandon 50-2	360k	Ref.		49
CDC 9429	360k	Unu.		69
Tandon 65-2L	360k	Ref.		69
Mitsubishi 501	360k	Unu.		79
Epson SD520	360k	New		79
Teac FD55E	720k/ss	Unu.		49
Mitsubishi 4853	720k	Unu.		89
Tandon 65-4	720k	Unu.		69
Toshiba	720k	Ref.		79
Mitsubishi 504B	1.2mb	Unu.		99
Teac FD55GFR	1.2mb	New		115
Panasonic JU475	1.2mb	Ref.		89
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MPI 51-S	180k	Ref.		39
Siemans FDD100-5	180k	Unu.		39
Tandon TM100-2A	360k	Unu.		89
W. Storage FDD211-5	360k	Ref.		59
Qume Qumetrak 542	360k	New		59
IBM LOGO	360k	Unu.		89
CDC 9409	360k	Ref.		79
MPI 52-S	360k	Ref.		69
Mitsubishi 4852	720k	New		69
Tandon TM101-4A	720k	New		49
Tandon TM100-4	720k	Ref.		69

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NEC 1165	DS	Unu.		199

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WD-WXT-GEN		79
WD1003-WA2 AT		149
ADAPTEC 2072A XT RLL		99
XEBEC 1210, XT, 10-20mb only		59
DTC 5287, AT RLL		195
SMC 4003, PC, XT, 10-20mb only		59
Perstor 200 Series, AT		225
LCS 6620, 16 MHz, AT		149
Data Master 44-800 – 3½", 5¼", 8" Floppy		125
Apple Controller, 4 Floppy		49
SCSI Controller, AT		350
ESDI Controller, AT/XT		250

3½" FLOPPY DRIVES — HALF HEIGHT

Mitsubishi MF351	400k	New	$	39
Mitsubishi MF353	720k	New		89
NEC FD1035	720k	New		89
Fujitsu Kit	720k	New		115
Teac FD135ND-KIT	720k	New		125
Teac HFD135 Kit	1.44mb	New		135

DRIVE CASES — ENCLOSURES

FULL HEIGHT

Hard Disc – with Power Supply	New	$	165
8" Floppy — with Power Supply	New		149
Dual Hard Drive — with Power Supply	New		195
Floppy — with Power Supply	New		99

HALF HEIGHT

Floppy — with Power Supply	New	$	99
Floppy — without Power Supply	New		29
Tape Drive — with Power Supply	New		165

THOUSANDS OF DISC DRIVES IN STOCK

90 DAY GUARANTEE ON ALL PRODUCTS EXCEPT "AS-IS".
☆ 1 YEAR MANUFACTURER'S WARRANTY.

NOTE:

New	– Mint condition.
Unused	– Removed from new system, never used.
Refurbished	– Used, repaired and tested by jb Technologies
As-Is	– Complete but untested, no guarantee on operating condition

APPLE COMPATIBLE WITH CASE & CABLE

II+, IIe $79
IIc $89
Drive only $59
Cable only $10
Case only $25

FOR TANDY

360K Single Sided Floppy Drive HALF HEIGHT or FULL HEIGHT $49

THIS MONTH'S SPECIALS

NEWBURY DATA 1140 ☆
ST506/412 Type Interface
28ms Access Time
119.8mb Formatted Capacity
Certified for use on NOVEL
Same as Maxtor 1140 $ 1,395

SEAGATE 4026 ☆
Full Height, 40ms, 20mb $ 295

SOFTWARE

Golden Bow V-Feature DLX	$ 110
Infotools Back-Up, Restore (360k)	10
Ontract Disk Manager	99
Volumizer	59

CABLES

XT Cable Set	$ 15
AT Cable Set	15
Apple Floppy Cable	10

HARD DRIVE REPAIR SPECIAL

REPAIR DISCOUNT COUPON

HARD DRIVE REPAIRS

Capacity	Flat Rate	SPECIAL PRICE
10-14mb	$75	
15-19 mb	$99	
20-30mb	$125	**$112.50**
31-40mb	$150	**$135.00**
41-49mb	$175	**$157.50**
50-85mb	$210	**$189.00**
86-120mb	$275	**$247.50**
121-150mb	$325	**$292.50**
Test & Evaluation	$25	

VALID THROUGH NOVEMBER 30, 1988

COUPON MUST BE SENT WITH DRIVE

jb Technologies
Dept. 319-011
21011 Itasca St. #F
Chatsworth, CA 91311

90 day warranty on all repairs.

5 day turn-around time.

24 hour turn-around time expediting service available.

OEM Experienced technicians.

SHIPPING YOUR DRIVE FOR REPAIR

Pack your drive carefully and well protected in a sturdy shipping box. Include with the shipment a note with your name, address, daytime telephone number and a brief description of the problem with the drive. Payment by cashier's check, money order or personal check (shipment after clearance) should be included. We also welcome Visa or Mastercard – include complete raised information from your card.

Ship the drive prepaid to:

jb TECHNOLOGIES INC.
Dept. 319-010
21011 Itasca St. - #F
Chatsworth, CA 91311

Return shipments will be sent Shipping & Insurance costs COD via UPS surface unless you pay by credit card, in which case, the shipping and insurance charges will be added to your charge card.

HARD DRIVE REPAIRS

Ampex, Atasi, CDC, CMI, Fujitsu, Hitachi, IBM, IBI, Maxtor, Micropolis, Microscience, Miniscribe, NEC, Quantum, Lapine, Priam, Rodime, Seagate, Shugart, Tandon, Titan, Toshiba, Newbury Data, and most other brands.

FLOPPY DRIVE REPAIRS

CAPACITY	FLAT RATE
180k - 500k	$35
501k - 1.2mb	$45

jb TECHNOLOGIES, INC.

21011 Itasca St., #F
Chatsworth, CA 91311

Telephone: (818) 709-6400

Telex: 678953
FAX: (818) 341-2935

TERMS AND CONDITIONS

- Visa or Mastercard welcomed.
- COD, Cashier's Check or Money Order.
- Personal Check - Shipment after Clearance.
- California residents must add applicable sales tax.
- All prices subject to change without notice.

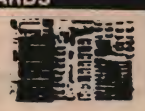
IBM™ COMPATIBLE COMPUTER WAREHOUSE

COMPUTER BARGAINS SAVE 40% to 80% OFF RETAIL

MONEY BACK GUARANTEE: At U.S.A. Electronics, we do more than make a sale to you. We strive to build a relationship through service and to achieve that we select quality products, price them fairly and guarantee them. Use and enjoy free on us for 5 days. If you are not satisfied, you may return for refund of purchase price, excluding both way shipping, etc.

MOTHERBOARDS

IBM XT™ COMPATIBLE



TURBO XT-640 640K Mem Max., 4.77/8MHz, selectable 2-layer board, completely tested w/no mem $89.75
Same as above with 2 pc. TX ROM Bios $99.75
TURBO XT-640 640K Mem Max., 4.77/10MHz, selectable board w/bios w/no mem $109.75
For an additional charge of $15 we can install memory and bios on your motherboard, completely test and burn it for best performance. Cost of memory not included.

AT MOTHERBOARDS

AT Turbo, 10MHz with OK installed $299.75
AT Super Turbo, 10MHz OK installed, multi layers $339.75
Baby AT Motherboard, 10MHz, OK inst ... $299.75
Baby AT Super Tubo, 10MHz, OK inst. multi layers $339.75

HARD DISK SYSTEM

20 Meg ST-225 seagate w/W. Digit cont. $269.75
20 Meg ST-225 Seagate drive only (65msec). $229.75
30 Meg ST-238 w/adaptek RLL controller. $299.75
20 Meg ST-4026 Seagate Full Ht Fastdrive (40Msec) $269.75
20 Meg ST-125 (30msec) w/ W. Digit controller 3½" seagate $299.75
HD Controller w/cables, W. Digital $69.75
30 Meg AT drive (40Msec) ST4038 seagate. $459.75
40 Meg AT drive (28Msec) ST4053 seagate .. $499.75
40 Meg ½ Ht. AT (40Msec) ST251 seagate. . $379.75
40 Meg miniscribe 3650 ½ Ht. $355.75
80 Meg AT drive (40Msec) ST4096 seagate. $639.75
63 Meg AT (40Msec) W/RLL seagate 277R. $569.75
63 Meg XT (40Msec) W/RLL seagate 277R. . $499.75
20 Meg Hard Card $339.75
30 Meg Hard Card $389.75
Priam ID-40 FH 40Meg (23Msec) $679.75
Priam ID-45 ½HT 45Meg (25Msec) $629.75
Priam ID-60 FH 62Meg (23Msec) $789.75
Priam ID-130 FH 130Meg (13Msec) $1899.75
Priam ID-100 103Meg w/RLL (16Msec) ... $1099.75
Priam ID-230 FH 230Meg w/RLL (12 25Msec). $2069.00
Priam ID-330 FH 330Meg w/RLL (9 25Msec). $3189.75
Novel 2.1 Driver $189.75

Macintosh II/SE Compatible

ST 138N Kit 32.3 Mb 3.5" ½H 28ms $519.00
ST 157N Kit 48.6 Mb 3.5" ½H 28ms $699.00
ST 277N Kit 64.9 Mb 5.25" ½H 40ms $689.00

FLOPPY DRIVES DSDD

40 Track Disk Drive all Half-Height

Fujitsu, Toshiba, Panasonic, Mitsumi, or TEAC. $79.75
1.2 Meg TEAC, Panasonic, Fujitsu, Mitsubishi, or Maple $109.75
3½" Fujitsu, Toshiba, Panasonic, Mitsubishi w/5¼" frame, complete-kit-720K $109.75
3½ Toshiba, Mitsubishi w/5¼" frame, complete-kit 144 Meg $139.75

POWER SUPPLIES

150 Watt/XT $49.75
180 Watt/XT $69.75
200 Watt/XT $79.75
200 Watt/AT $79.75
220 Watt/AT $84.75
235 Watt/AT or 386 . $94.75
IBM PC-JR Extrnl ... $29.95

MONITORS

Magnavox TTL $84.75
Samsung TTL tilt/swivel HiRes $79.75
Samsung Composite $89.75
Mitsuba 14" TTL flat scr. $129.75
Thomson 14" TTL/composite works with monographic and col. card ... $129.75
NEC Multisync II $619.75
Magnavox Multisync CM873 ..... $509.75
Samsung Multisync 4551. ..... $489.75
Mitsubishi Multisync Diamond Scan AUM 1371 or 1381A $519.75
Magnavox RGB 8762 Res 640x240 ..... $265.75
Mitsubishi 1409 RGB 640x240 ..... $299.75
Samsung CD-1464 RGB 640x240 ..... $249.75
Mitsubishi EGA 1410. 640x350 ..... $419.75
Magnavox EGA 540 ..... $409.75
Packard Bell EGA 1422 ..... $399.75

IBM CLONE TECH MANUAL XT

An extensive manual that helps in assembling your clone-compatible system and explains how to use different Add-on boards and hook-ups. Explains the different switch & jumper settings, formating drives and covers trouble-shooting techniques in both XT and Turbo XT systems with schematics $24.95

AT OPERATING MANUAL $24.75

Real exhaustive manual, nicely written in easy to understand language. A must for AT system owners.

PS/2 HARD DRIVE SUB SYSTEMS

For model 25, 30 with face plate mounting rails and complete hardware. 20 meg, 30 meg, 45 meg and 67 meg formated capacity. **Please call for prices.**

PS/2 EXT./FLOPPY DRIVE SYST. 5-25"

Now you can use all your old software and data disks on the new PS/2 System. Convert them to 3.5" format, or use them in the 5.25" format. It's compatible with PS/2 Model 25, 30, 50 and 80. **$269**

ACCESSORIES

Keyboard drawer-strong & sturdy $36.75
4" cooling fan 120 VAC $9.75
Vertical computer stand $26.75
Monitor stand-swivel/tilt $12.75
Monitor stand-swivel/tilt heavy duty $16.75
Super Surge Hash filter/6 outlets $10.75
Power Supervisor — Surge Protector and noise EMI/filter with 6 front switches (This is placed in between top of case and monitor) $39.75
5¼" Floppy Head Cleaning Kit $5.75
Dust Cover Set for computer & keyboard .. $10.95
Printer Stand safety coated steel wire $15.95
Premium Tool Kit with chip puller, inserter, etc. $26.95
DB 9 Male/Female solder pot 1.25 ..... hood $0.90
DB 25 Male/Female solder pot 1.75 .... hood $1.25
Copy Holder $19.95
3 Volt L Battery $2.50 ea. or $19.50/10 Holder $0.75
3 Volt alkaline battery kit for AT-286 ..... $15.75
Sweet "P" 100 plotter cable IBM $16.75
Sweet "P" 100 plotter diskette IBM $8.75
Sweet "P" 100 plotter manual $8.75
Transparency paper 8½x11" (pk of 10) $3.95

COMPUTER PAPER STAR LASER CUT

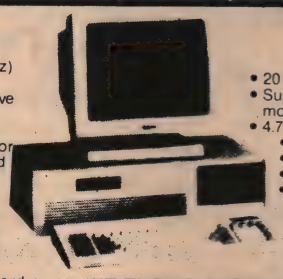
2400 sheet box 9½x11" $21.95
1000 sheet box 9½x11" $12.95
2400 sheet box #15 14⅞x11" green bar ... $29.95
Mailing Labels 5,000 1-across $12.95

MIRACLE! You can make it happen. From August 15 until Dec. 31, 1988, we will donate 2% of the value of your order for humanitarian cause. If you like, you can donate to the institution of your own choice. We will send you the check and you can mail it yourself. GIVE AND GOD WILL BLESS YOU.

HELP THE NEEDY.

BASIC TURBO SYSTEM $699

- Intel 8088-2 (4.77 & 8MHz)
- Compatible Keyboard
- 1 Half-Height Floppy Drive
- 640K Memory
- 150 Watt Power Supply
- Monochrome TTL Monitor Monographic Hi Res card
- 8 Expansion Slots
- PAR or SR Port



SUPER XT TURBO R.G.B. COLOR SYSTEM $1299

- 20 Meg Hard Drive
- AT style keyboard
- Super Stable 2-layer motherboard
- 640K RAM memory
- Bundled Software
- 4.77 or 8 MHz operation
- Single Floppy Drive
- Hi-Res Color Graphics card
- RGB High Res color monitor
- Ser. Par. Game/Clk/Cal Ports

IBM® AT CLONE SYSTEM $1399

- 80286 Proces @ 10MHz
- 640K RAM on 1 Meg board
- 20 Meg Hard Drive
- Single floppy drive 1.2 meg
- Mono graphics
- Para. Ser. Ports
- High Res mono monitor
- Enhanced AT keyboard
- 200W Power Supply
- Bundled Software
- AT Operating Manual

XT TURBO SYSTEM $1099

- 20 Meg Hard Drive
- Super Stable 2-layer motherboard
- 4.77 or 8 MHz operation
- Single Floppy Drive
- Mono Graphics Card
- Ser Par. Game. Clk/ Cal Ports
- AT style keyboard
- 640K RAM memory
- Hi Res TTL monitor
- Bundled Software

USA-386 SYSTEM $2599

- Intel 80386 Processor
- 16 MHz System Speed
- 80387 Socket
- 1 Meg memory installed
- Serial-Parallel Ports
- Built-in clock/calendar
- 220W Power Supply
- Monochrome Graphics
- 40 Meg Hard Drive
- Hard/Floppy Controller
- 1.2 Meg Floppy Drive
- Amber High Res Monitor
- Keytronic enhanced 101 Keyboard

All systems have 1 yr. warranty on parts and 90 days on labor. no hidden extras.

MIRACLES DO HAPPEN.

YES! YOU CAN MAKE THE DIFFERENCE. IBM ADD ON BOARDS

STOCK #	DESCRIPTION	PRICE
CONTROLLER CARDS		
FDC-501	Floppy disk controller/2 drives w/cable.	$24.75
FDC-502	Floppy disk controller 4 drives w/cables for 2 drives	$32.75
FDC-503	Floppy controller for 1.2 meg drive for XT or AT	$59.75
FDC-507	Floppy cont. I/O w/serial, parallel, clk/cal game ports	$59.75
FDC-508	Short I/O plus II card w/ser. para.clk/cal.game ports	$54.75
FDC-519	Self confugarating XT-I/O card between com I & II or LPTI & II	$79.75
HDC-515	Hard disk controller w/cables W. Digital.	$69.75
HDC-516	Floppy & HD controller board for AT W.Digital	$129.75
HDC-517	Adaptek Board 2070A RLL HD cont. format STD 20 meg dr. to full 30 meg	$79.75
HDC-518	16 Bit RLL hard drive cont. w.dig. RAH.	$139.75
HDC-519	16 Bit RLL hard/floppy cont. w.dig. RA2.	$149.75
HDC-520	16 Bit RLL hard/floppy cont. adap.-2372.	$169.75
VIDEO CARDS		
VID-402	Color graphic card w/printer port HiRes IBM specs	$49.75
VID-408	Hi-Res mono/graph w/printer port Herc. comp	$49.75
VID-410	Dual color or monographic card	$59.75
VID-411	Monographics w/para.ser.game. clk/cal for XT	98.75
VID-424	Sigma 480 EGA card 640x480	$189.75
VID-425	Everex EGA graphic card w/p port	$169.75
VID-423	Everex EGA card-no p/port	$149.75
VID-426	EGA graphic card Graphmaster II	$179.75
VID-427	Video-Vega-7 EGA card	$169.75
VID-430	Vega Deluxe EGA card	$219.75
VID-431	Vega Deluxe VGA card	$289.75
VID-435	Everex VGA card	$289.75
VID-432	Paradise EGA card 640x350	$149.75
VID-433	Paradise EGA Autoswitch 650x480	$189.75
VID-434	Genoa EGA 800x600 w/gym Graph	$229.75
SERIAL PORT CARDS		
SIO-250	Serial port card (second serial opt.)	$29.75
SIO-251	Serial port card w/2 serial ports inst.	$44.75
SIO-252	2nd sr. port kit w/chips & cable	$19.75
SIO-253	AT ser. (2nd opt.) para & game I/O	$59.75
SIO-254	Serial port card w/4 ports for AT	$98.75
SIO-255	Serial port card w/4 ports for XT	$89.75
MEMORY BOARDS		
MFC-100	384K Multi-funct. w/parallel ser., clk/cal game	$79.75
MFC-120	576K memory expansion board	$34.75
MFC-121	XT above board mem. 2 meg max	$99.75
MFC-122	AT above board mem. 2 meg max	$109.75
MFC-123	AT above board mem. 3 meg max	$119.75
OTHERS		
PIO-255	Parallel printer port card	$17.75
FDC-509	Clock Card	$27.75
FDC-510	Game port card w/2 ports	$19.95
FDC-511	Clock card w/game port	$39.95
FDC-512	Joy stick-w/2 buttons	$18.95
FDC-513	Joy stick multi-funct. prem. quality	$26.95
FDC-514	**No slot clock on chip**	$49.75
MOUSE SYSTEM		
Logi Mouse	Bus Version	$89.75
Logi Mouse	C-7 Package, serial	$79.75
Logi Mouse	w/publisher	$119.75
Microsoft Mouse	Serial or Bus	$109.75
Microsoft Mouse	with Paint Brush Sr. or Bus.	$119.75

FAX MACHINES

Toshiba 30100

- Transmits 8½"x11 documents in as little as 15 secs
- Simple one-touch controls, no training required
- Auto. receives incoming documents
- Works as copy machine and copies documents up 8½" wide $1139

Toshiba 3300

All the features of 30100 plus

- Automatically feeds up to 5 sheets
- Delay-send and polling features for productivity when phone rates are lower $1289

Fax Paper Toshiba

6 rolls 8½"x97' 27.95

FAX BOARD

An add-in board for MS-DOS PC's which serves as a facsimile machine compatible with all Group III machines. It digitizes the document to be Faxed and stores it on computers hard disk $429.00

MODEMS (Hayes Comp)

Everex 2400 Internal $179.75
Everex 300/1200 Internal $89.75
Suntek 300/1200 internal $79.75
Complus 300/1200 internal ... $79.75
Complus 1200 Baud internal. $159.75
Everex Extnl 2400 Baud $209.75

TAPE BACK-UP

Irwin 10 Meg Internal $199.75
Irwin 20 Meg Internal $369.75
Irwin 40 Meg Internal $439.75
Irwin 20 Meg External $449.75
Irwin 40 Meg External $539.75
Controller Card $98.75

HAND SCANNER

Hand held device for scanning graphic images into MS-DOS PC's and has resolution of 200 DPI and can scan an image up to 2" by 10 inches. Comes with soft stationery software which displays the image as it is scanned and saves the image to a variety of formats. $199.75

NEW IBM COMPATIBLE TEXAS ROM BIOS

A new 2 chip BIOS set that replaces the existing ROM Bios on your compatible **Turbo-XT** motherboard. These eliminate many timing, parity and system errors. Also eliminates the occasional "hang up" problems in the **Turbo XT** boards. Runs all software for IBM computers. $24.95
STD Motherboards 1 chip $19.95
For 10 MHz boards 1 chip $24.95
For AT-286 Board 2 chips $49.75
RAM Test Bios-complete RAM test. $24.95

CHIPS - ICs EPROMS

Call for Current Prices

Your Direct Source

DYNAMIC RAM CHIPS

4164 Set of 9 150 NS
128K Set of 18 for AT Piggy back
41256 Set of 9 150 NS
41256 100 NS
41256 80 NS
4164 120 NS
4164 100 NS
4464 120 NS
1MBIT 1048 KX1
1MBIT 256 KX4

Please call for prices due to price fluctuation
3% credit card surcharge only for D-RAMs

EPROMS

2764 (250 NS) $3.95 | 27256 (250 NS) $5.75
27128 (250 NS) $5.25 | 27512 (250 NS) $11.75

CO PROCESSORS

8087-3 (5 MHz) $109.75
8087-2 (8 MHz) $159.75
8087-1 (10 MHz) $199.75
80287 for AT (8 MHz) $265.00
80287 for AT (6 MHz) $185.00
80287 for AT (10 MHz). $299.00
80387 for 386 (16 MHz). $499.00
80387 for 386 (20 MHz) $729.00

V-20 5MHz .. 10.75 | 8088 5MHz .. 8.75
V-20 8MHz .. 14.75 | 8088-2 8MHz .. 12.75
V-20 10MHz .. 24.75 | 8088-1 10MHz .. 19.75
V-30 8MHz .. 24.75

RAM CHECK DEVICE

Checks 256 and 64K Memory chips in 2-3 seconds and verifies if a memory chip is good or bad. Real good investment especially when the RAM prices are so volatile $219.75

KEYBOARDS

Maxi switch AT/XT $56.75
Keytronic AT/XT $56.75
PC/XT look alike $49.75
Enh. AT/XT w/12 top F-keys Keytronic or maxiswitch-101. $69.75
Enh.-101 keyboard by Honeywell. $79.75

AT/XT PORTABLE CASE

Keyboard, 150 Watt Supply, Monitor and all Hardware can accommodate XT, Baby AT or AT M/boards **$549**

DATA SWITCH BOX

AB-2way $24.95 ABDE 4way $34.75
Gender Changer M/M or F/F . . $4.75

SUPER EPROM PROGRAMMER

EPROM sizes: 2716-27512 Programs "A" Type Chips can program 4 EPROMS at a time! **$179**

EXT. DRIVE CASE

Holds 2 ½HT drives. Needs no power supply. Complete with connecting cables. **$89.75**

ROCKET - 286

It fits right into your XT board and gives you all the performance of 286 System with 8K Cashe mem. **$199.75**
Everex Accelerator-286 ..... **$259.75**

COMPUTER HARDWARE

Half-height dr. filler plate $1.75
AT mounting rails $3.75
Dual drive mount bracket $3.75
Rear slot filler plate $0.25
AT grounding straps $0.30
Plastic MBD Standoffs $0.45
Disc Drive mount. screws $0.15
DB-25 Locking screws $0.15
Plastic card guides $0.40
Speaker w/bracket $3.75

COMPUTER CASES

IBM XT type look-a-like slide in type $29.95
IBM XT type look-a-like flip-top $34.75

AT JUNIOR STYLE CASE

For Your XT Motherboard

- LED Indicators, Key Lock and reset button $49.95

AT COMPATIBLE CASE

Enhanced with reset switch in front...$69.95
Same as above w/3 floppy openings. $76.75
Baby AT Case $59.75
AT Tower case w/bay opening $269.75
AT Tower case w/digital readout $299.75

CABLES FOR IBM SYSTEMS

CAB-98	Multi I/O SR cable	$8.75
CAB-300	6' IBM power cable	$3.75
CAB-400	Dual 5¼" floppy disk drive cable	$8.75
CAB-401	Dual floppy cable external use	$19.75
CAB-425	Hard disk cable set XT	$8.75
CAB-426	Dual hard disk cable set XT	$14.75
CAB-450	AT cable (set dual hard & floppy)	$16.75
CAB-500	Keyboard ext. cable 6'/10'	$6.75/9.75
CAB-501	6' keyboard cable	$6.75
CAB-550	Composite video cable 6'	$4.75
CAB-600	RGB ext. cable, DB9 M/F	$8.75
CAB-601	Special 8 pin RGB to DB9 cable	$15.75
CAB-602	TTL monitor ext. cable 6'	$8.75
CAB-800	IBM Pr. cable (Centronics) 6'/10'	$8.75/11.75
CAB-803	IBM printer cable 15'/25'	$18.75/$29.75
CAB-801	Rt. angle IBM Pr. cable 6'/9'	$12.75/16/75
CAB-802	IBM printer cable Cent-Cent 6'	$14.75
CAB-825	Serial, DB25 M/M 6'/9'	$8.75/11.75
CAB-835	Serial, DB25 M/F 6'/9'	$8.75/11.75
CAB-875	IBM/AT serial port cable 9-25 Pin	$9.75
CAB-97	Adapter cable pwr supply to monitor	$8.75

IBM PUBLIC DOMAIN SOFTWARE $3.95/dk

3 PC-Checkbook
4 PC-Modem (Communications)
6 Home Finance Program
7 Free Calc - Spreadsheet
8 PC-Basic (runs BASIC program)
9 PC-Calculator
10 Point of Sale Program
11 Misc DOS super utility
13 Misc Appl Music. Dates
15 PC DOS Help
16 Word Processor/kids
17 Time & Money - Finance Manager
18 PC-Musician
19 Prop. Mngr (dBaseII)
21 Micro Accounting Sys.
28 Star Trek Programs
29 Games 1
30 Games 2
31 BASIC Games
32 BASIC Games
33 Misc BASIC Games
34 Galaxy Trek w/graphics
35 CPU Speed Test
37 Toolbox 1-DOS Utility
38 Toolbox 2-DOS Utility
39 Toolbox 3-DOS Utility
45 Flow Charter
46 Music
47 Printer Art
48 Piano Man
49 Dictionary
50 Home Inventory Sys.
51 Spacewars
60 File Managers
61 Personal Finances
62 Languages
63 Hobbies
64 Commodities Tracking
65 Laserjet Printing
66 Label Master
67 Loan Amortization
68 Business Letters
69 Unprotect-III
81 PC Type
82 Automenu
83 PC Gen Ledger
84 PC Tutorial (MS DOS)
85 Jetset Flight Simulator
86 Backgammon & Wheel of Fortune
87 Card Games
88 PC Chess
89 Super Pinball Games
90 Managing Money
91 Directory Assistant/ Phone Book
92 PC-Stock
93 Starship
94 Bridge with Tutorial
95 Poker Casino Style
96 Slide Shows on PC
97 PC Payroll
98 Basic Tutorial
99 Forms Maker
100 Banner Maker
101 Animator Creator
102 3D Modeling/Design
103 3D Creator/Editor
104 Flags of Nations

SPECIALS:

52 Super game collect (4 disks) $19.75
70 Mr. Bill (invoice prgm 2 dsks) $12.75
71 New York world (word processing 2 dsks). $12.75
72 Clk setting prgms ... $9.75
73 dBASE clone 2 dsks. $15.75
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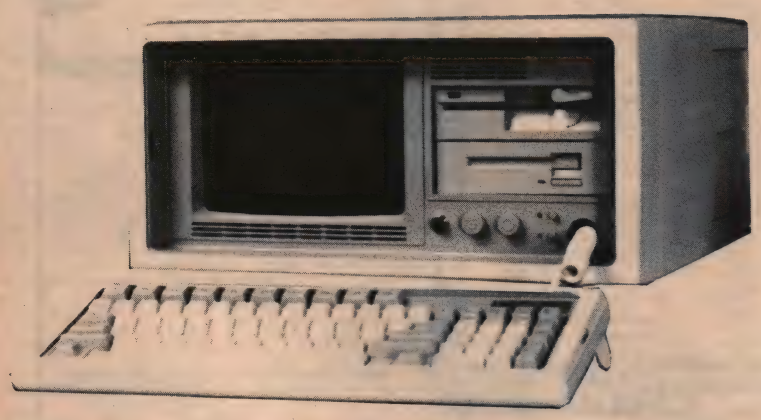

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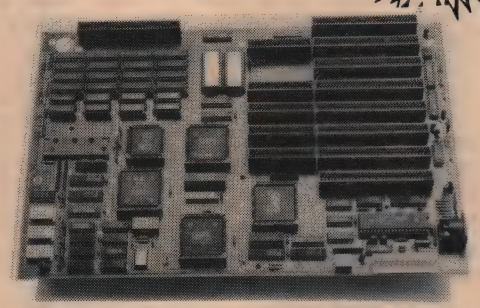

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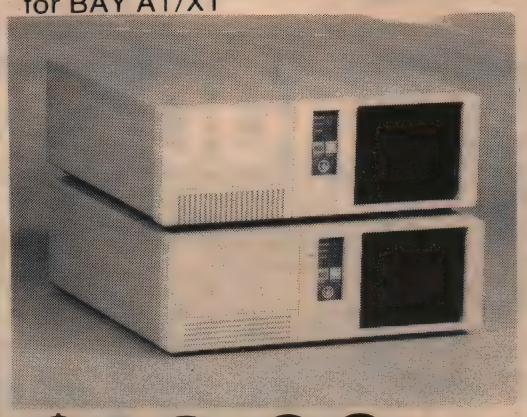

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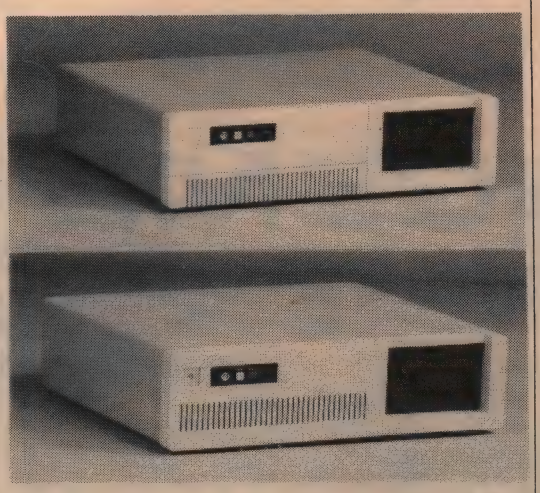

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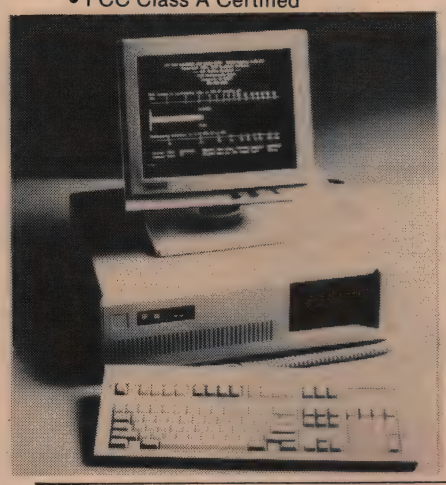

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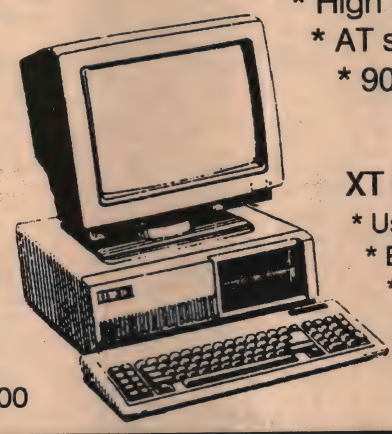

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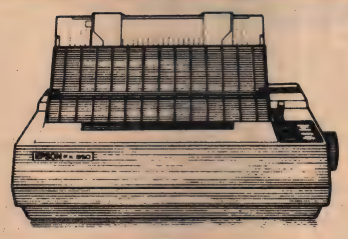

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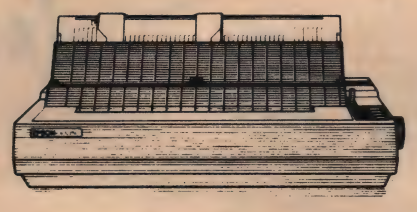

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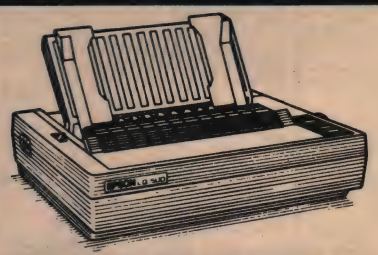

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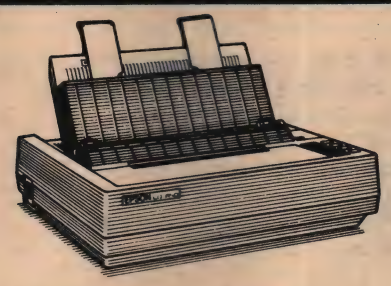

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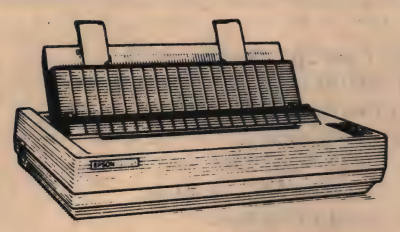

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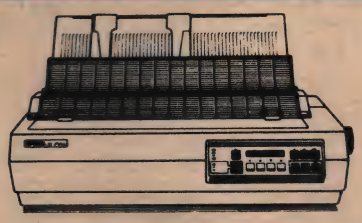

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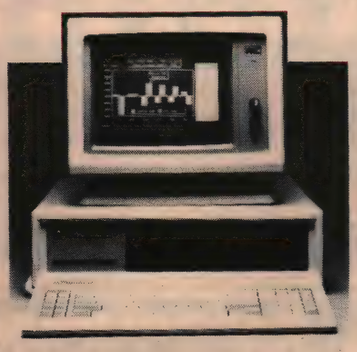

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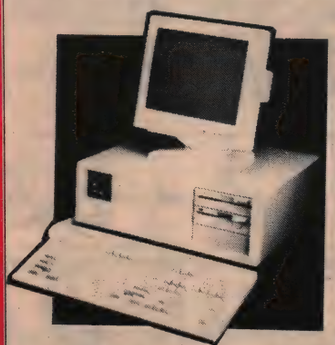

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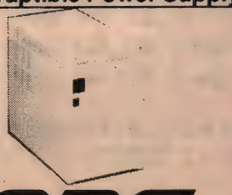

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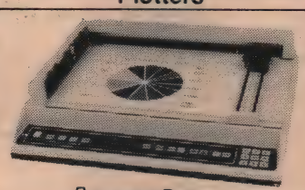

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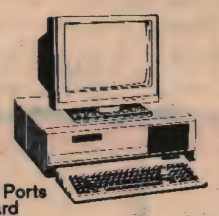

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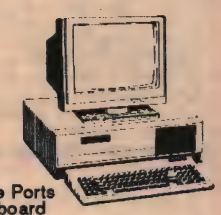

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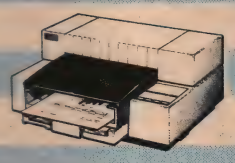

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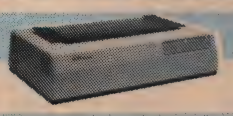

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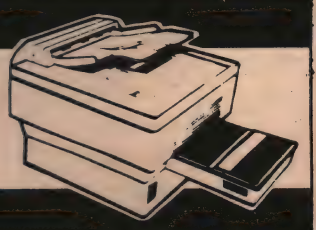

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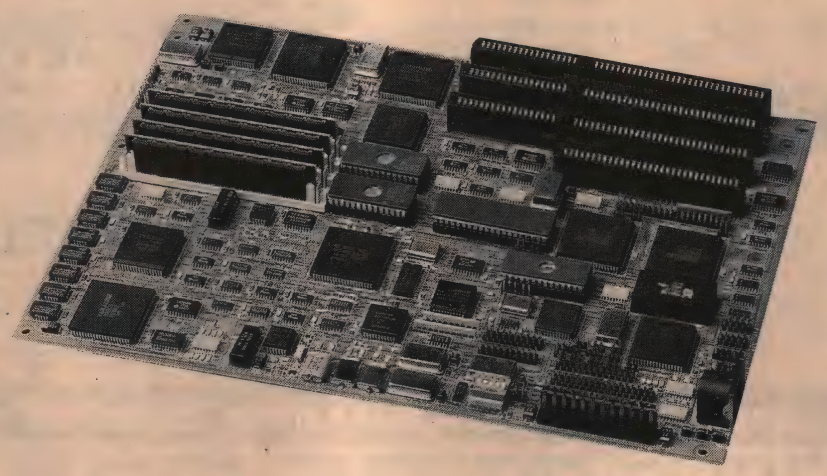

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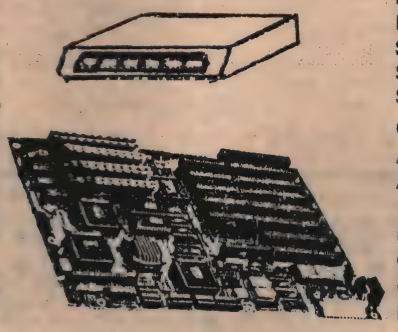

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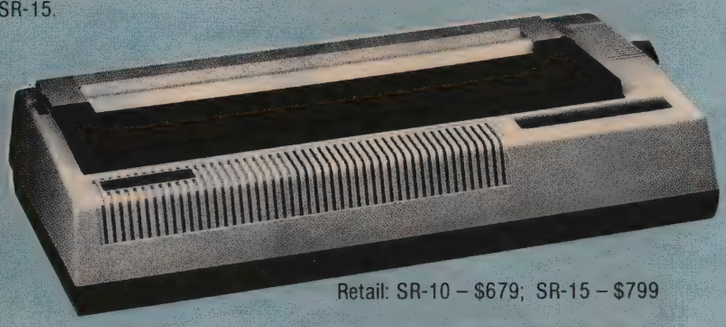

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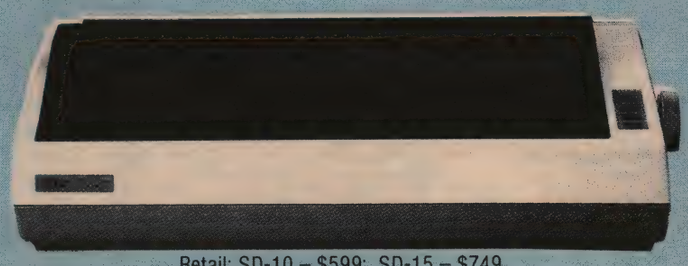

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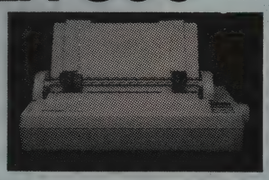

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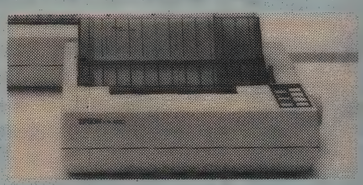

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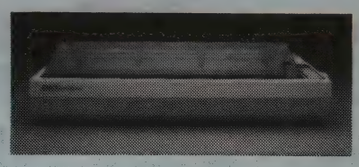

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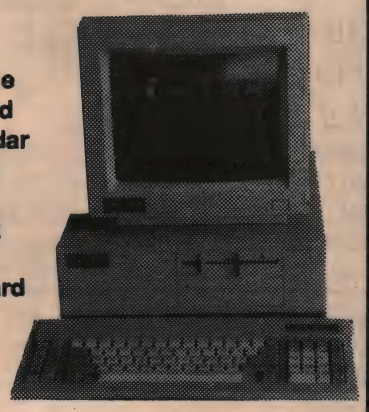

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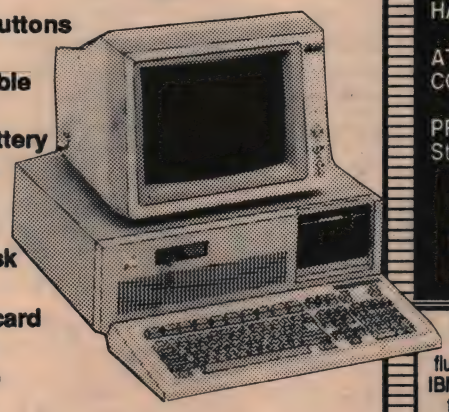

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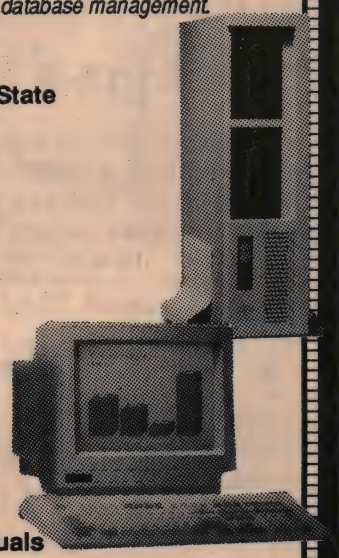

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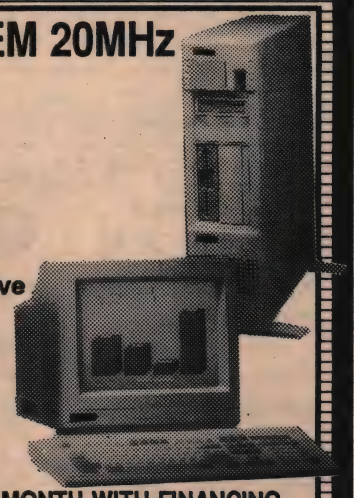

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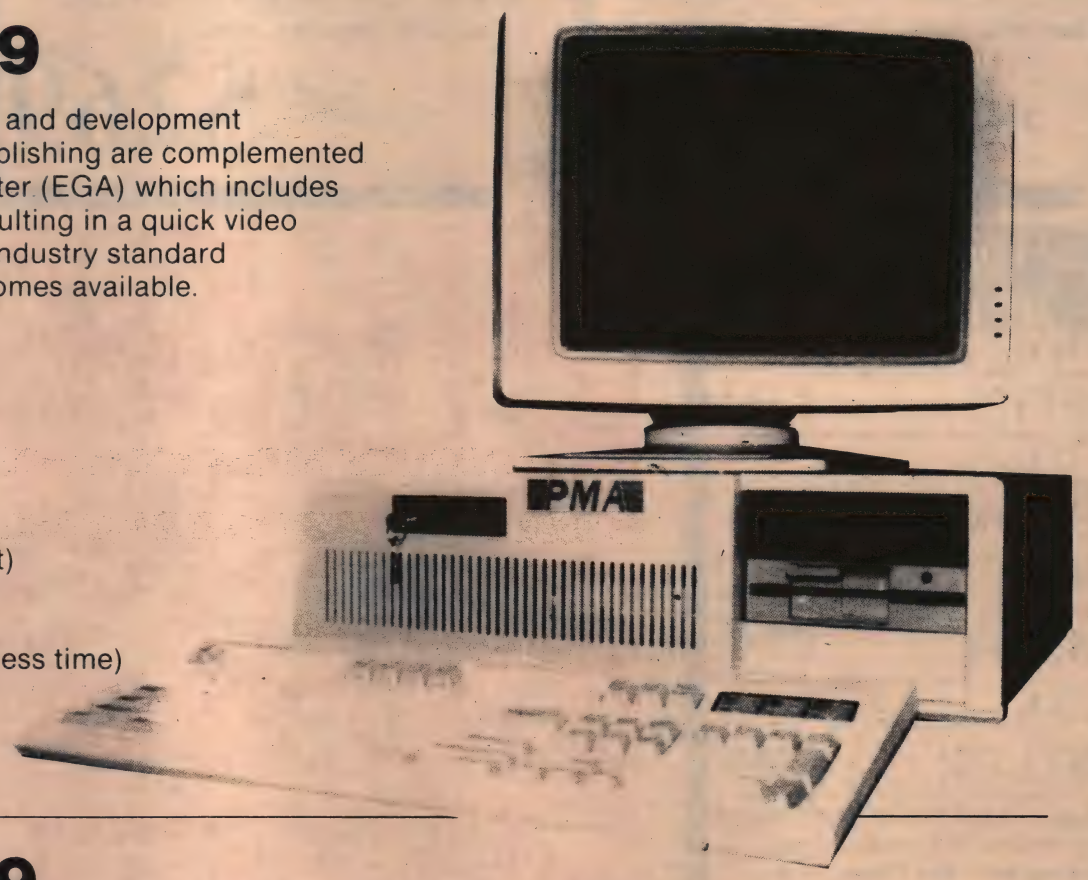

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196	OEM-IBM5218/5219 Displaywriter M/S OEM	12.35
222	IBM 6240 M/S	1.95
812	OEM-IBM Quietwriter N/C	12.05
740	IBM Wheelwriter Corr.	3.85
730	IBM Wheelprinter M/S	8.65
320	IBM Selectric II H.Y. Corr.	1.75
202	OEM-NEC2000/3500/8800FlipM/S	12.75
201	NEC 5500/7700 Spinwriter M/S	2.75
303	Nakajima Corr.	3.85
304	Nakajima M/S	6.05
334	Olivetti ET 201/121 Corr	3.35
334B	Olivetti ET 121/351 M/S	4.85
222	Qume I/Sprint 3/5 M/S	1.95
223A	Qume III Quick Load	2.65
219	Qume IV Sprint 7,8,9,10,11,12 M/S	3.25
227	Ricoh 1300/1600 M/S	3.25
251	Wang System5581/6541M/S Matrix	3.25

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450	Centronics 100/300/500	4.15
453	Data 100/300/400	5.25
454	Decision Data 6807/6811/6814	7.65
455	Dec writer LA 30/36	2.75
456	Dec writer LA 120/180	3.85
480	Facit 4540/4542 Black	4.05
462	IBM 3262/5262	5.45
465	IBM 3525 T/S	3.35
463	IBM 5211	4.15
464	IBM 5225/5250/5280	15.95
470	Okidata 80, 82, 92, 93	1.35
471	Okidata 84, 94	2.75
467	Printronix 150/300/600	5.45
955A	Seiko Universal Black/Red	1.15
470	Star Micronics Gemini 10/10X	1.35
455	Texas Instruments 800/810/815	2.75
456	Texas Instruments Omni 820	3.85
401	Wang 2221/5521	3.45

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0276P-Data Products 2400 14½"x15yds.	15.15
0356P-Documation 1200 15"x20 yds.	17.05
0456P-Honeywell Pru1200 17.6"x22yds.	20.85
0106P-Hitachi 15"x20 yds.	17.55
0556P-IBM 1403/3203/4245 14"x20 yds.	14.95
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0976P – Univac 0776 15¾"x20 yds	17.65

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		*AT Kit	*XT Kit
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MiniScribe 8438 (RLL)	30mB 65 msec hh	$225.00	$285.00
MiniScribe 3650	40mB 61msec hh	$299.00	$349.00
MiniScribe 3675 (RLL)	64mB 61msec hh	$339.00	$399.00
MiniScribe 3053	44mB 25msec hh	$449.00	$499.00
MiniScribe 6079 (RLL)	66mB 28msec fh	$539.00	$599.00
MiniScribe 6085	72mB 28msec fh	$549.00	$599.00
MiniScribe 6128 (RLL)	108mB 28msec fh	$599.00	$659.00

Seagate

Seagate 225	20mB 65msec hh	$215.00	$265.00
Seagate 238R (RLL)	30mB 65msec hh	$225.00	$285.00
Seagate 251-0	40mB 39msec hh	$359.00	$409.00
Seagate 251-1	40mB 28msec hh	$449.00	$499.00
Seagate 277R (RLL)	60mB 39msec hh	$399.00	$459.00
Seagate 4096	80mB 28msec fh	$649.00	$699.00

*XT kits include cables, rails, software (over 32 mB), controller, and instructions.
*AT kits include cables, rails, software (over 32 mB), and instructions.

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HC 20	20mB 65msec	$299.00	$299.00
HC 30	30mB 65msec	$329.00	$329.00
HC 40	40mB 65msec	$449.00	$449.00

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		Model 25	Model 30
PS 20	20mB 40msec	$349.00	$349.00
PS 30	30mB 40msec	$359.00	$359.00

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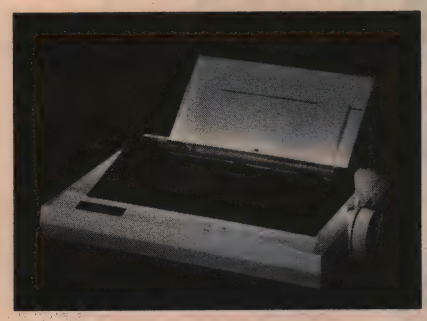

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ST251-1	40 MB, 28 MS, AT KIT	395
ST277R	65 MB, 40 MS, AT KIT	384
ST277N	45 MB, 40 MS, AT KIT	439
ST4096	80 MB, 28 MS, AT KIT	541

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ST138	30 MB, 28 MS / 40 MS AT KIT	264
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2372	145
2322	235

OMTI

5520	$64
5527	69

intel

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8087-1	194
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80287-8	234
80287-10	274
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Model 50-20	$2,575
Model 50-30	$2,949
Model 60-40	$3,399
Model 60-70	$3,650
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Model 80-40	$4,279
Model 80-70	$4,875
Model 80-15	$6,750

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386 Deskpro 130	$6,750
286 Deskpro 12 MHZ	$1,675
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Compaq Portable 386 Model 40	$5,650
Compaq Portable 386 Model 100	$6,950

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Club 80286	Call for Price
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80 MB ST4096	$725

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5¼" 360K	$89
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Princeton HX 12	$419
Princeton HX 12E	$449
IBM Mono 8503	$199
IBM Color Display 8512	$449
IBM Color Display 8513	$525
IBM Color Display 8514	$1,150
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Samsung Amber TTL Mono	$79
Samsung 12" Flat Amber	$89
Samsung 14" Multisync	$429

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Panasonic 1081 II	$159
Star NX-1000	$169

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Everex 2400 External	$199
Hayes 1200 Internal or External	$269
Hayes 2400 Internal or External	$419
Practical Peripheral 1200 Internal	$79
Practical 1200 External	$149
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Practical 2400 External	$179

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Microsoft Excel	$329
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Multiplan	$135
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PC Anywhere III	$89
PFS Professional Write	$119
PFS Professional File	$145
PFS First Choice	$89
Quattro	$149
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Revelation	$469
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ENTRY MODEL SYSTEM

- 1.2 MB Floppy Drive.
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- 80286-16CPU. CMOS by Harris.
- 1MB SIM Module RAM On Board.
- HD/FD Controller Card.
- AT Style Keyboard.
- 200W Power Supply.
- AT Case.

(w/3 LED, Reset Button, Turbo Button, Keylock & 3 Openings)

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25/20/16 MHz Motherboard

- Available in 16 MHz, 20 MHz & 25 MHz
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- Sockets for 80287 & 80387/Weitech
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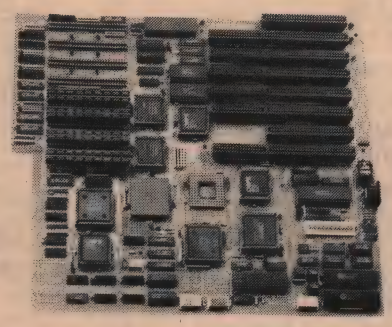

NOVAS SUPER TURBO NEAT
286-20 MHz Motherboard

- 80286 CMOS CPU by Harris
- Norton SI=23.0 (ver. 3.0), Landmark CPU Speed Test=26.4
- Selectable speed 20/12/10 MHz-0/1 Wait
- Memory Expandable to 8 MB (SIMM) on board.
- Interleave/Page Mode Memory 0 Wait State.
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- Open socket for optional 8087 co-processor
- 512K Standard RAM, expandable to 640KB on motherboard or with expansion card
- Hercules™ monochrome graphics emulation
- Monochrome and RGB monitor ports
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- Includes high resolution monitor (amber or green)

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Item Number	Shipping & Handling
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LED230-CS988	32
LED265-CS988	32

FROM $1196

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- 5.25" half-height 1.2MB floppy disk drive
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- Communications
- Presentation graphics

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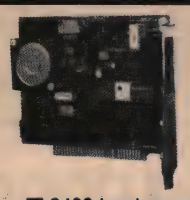

- Hayes compatible
- Half card internal modem for all IBM PC, XT, AT and compatibles

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Mfr. Retail ~~$295~~

ONLY $119.95

- 2400 baud operation with automatic fallback to 1200 baud
- Auto dial/auto answer
- "AT" command set
- 2 year warranty

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Leading Edge Word Processor with Spell Checker

Item	Shipping & Handling
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Mfr. Retail ~~$99~~

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Network Version 1.5A
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Lotus 1-2-3 Look Alike! The Twin

Item	Shipping & Handling
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—PC Week, May 6, '86

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- Twin version 1.5 equiv. to Lotus 1-2-3 release 1A
- Reads and writes Lotus files
- Superior graphics to Lotus
- Supports Hercules, CGA and EGA graphics

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10" 192 cps Dot Matrix Printer

Item	Shipping & Handling
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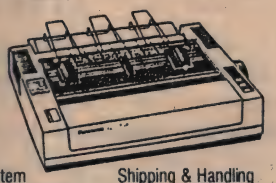
ONLY $205

- 192 cps Draft; 38 cps NLQ
- Near Letter Quality printing in all pitches
- E-Z Set operator-accessible print mode selector
- High resolution, dot-addressable graphics
- Friction feed and adjustable tractor are standard
- Courier and bold NLQ fonts
- Proportional space printing

Panasonic KX-P1080i

10" 144 cps Dot Matrix Printer



Item	Shipping & Handling
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Mfr. Retail ~~$299~~

ONLY $174

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- Near letter quality printing in all pitches
- Proportional space printing
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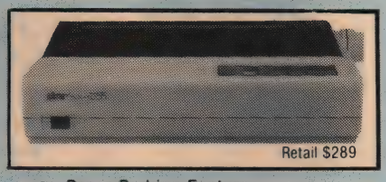
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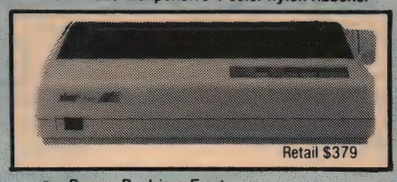
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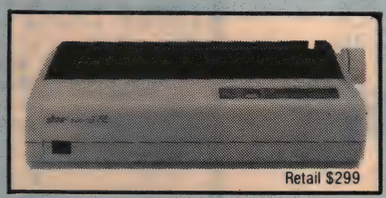
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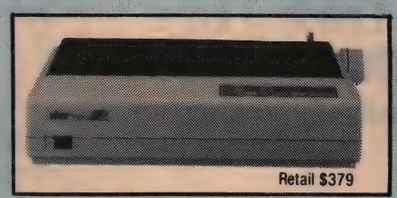
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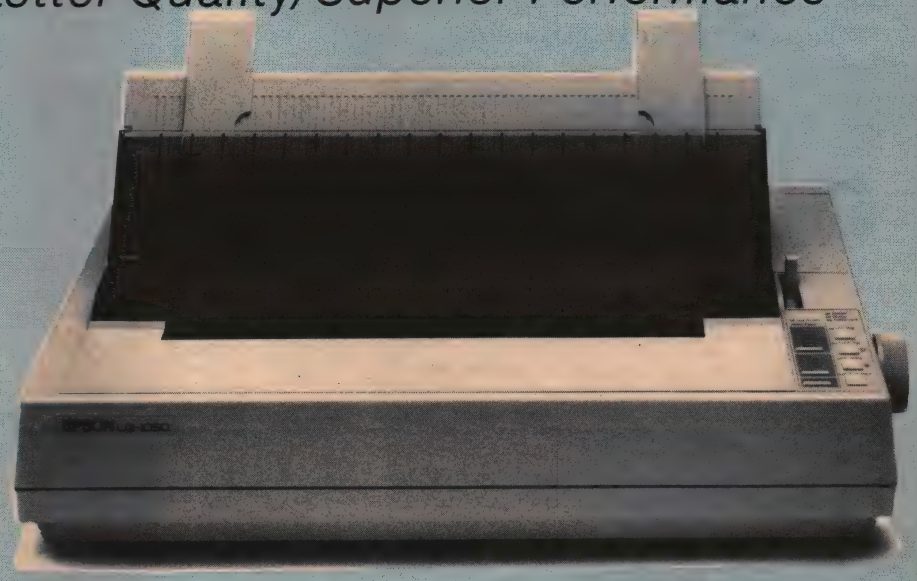

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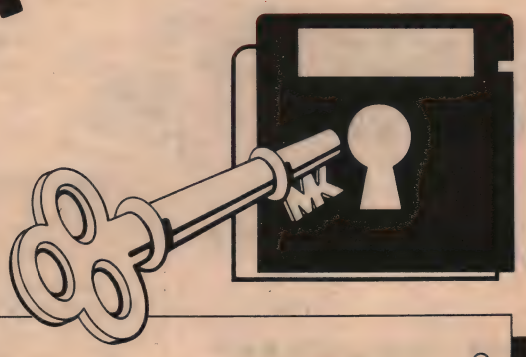


```
C:>DEBUG PROGRAM.COM
-D100 136
8848:0100  EB 18 49 6E 63 6F 72 72-65 63 74 20 44 4F 53 20  k.Incorrect DOS
8848:0110  76 65 72 73 69 6F 6E 0D-0A 24 50 B4 30 CD 21 86  version..$P40M!.
8848:0120  E0 3D 36 01 72 05 3D 0A-02 76 09 BA 02 01 B4 09  `=6.r.=..v.:..4.
8848:0130  CD 21 CD 20 58 EB 2F                             M!M Xk/
-Q
```

turn this into this!

```
H00100: JMP     Short H0011A                    ;00100 EB18          __
;-------------------------------------------------
        DB      "Incorrect DOS version"         ;00102 496E636F727265
        DB      0Dh                             ;00117
        DB      0Ah                             ;00118
        DB      "$"                             ;00119 24
;-------------------------------------------------
H0011A: PUSH    AX                              ;0011A 50            P
        MOV     AH,30h                          ;0011B B430          _0
        INT     21h             ;1-DOS_Ver_Number ;0011D CD21        _!
        XCHG    AH,AL                           ;0011F 86E0          __
        CMP     AX,0136h                        ;00121 3D3601        =6_
        JB      H0012B          ; . . . . . .   ;00124 7205          r_
        CMP     AX,020Ah                        ;00126 3D0A02        =__
        JBE     H00134          ; . . . . . .   ;00129 7609          v_
H0012B: MOV     DX,0102h                        ;0012B BA0201        ___
        MOV     AH,09h                          ;0012E B409          __
        INT     21h             ;1-Display_String ;00130 CD21        _!
        INT     20h             ;TERM_normally:20h ;00132 CD20       _
;-------------------------------------------------
H00134: POP     AX                              ;00134 58            X
        JMP     Short H00166                    ;00135 EB2F          _/
;-------------------------------------------------

MASTER*KEY XREF - PROGRAM.XRF                                  Page 1

0102h                   :   121   2F5   301   320
020Ah                   :   126
03CBh                   :   12B
1-Display_String        :   130   591   610
1-DOS_Ver_Number        :   11D
H00100                  :   100
H0011A                  :   100   11A
H0012B                  :   124   12B
H00134                  :   129   134
H00166                  :   135
TERM_normally:20h       :   132
```

NOTE: The cross-reference is by memory location within the program file!

NOTE: The output is totally Microsoft MASM-compatible.

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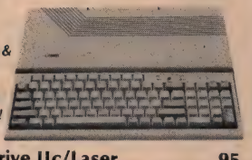

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FEEDBACK FORUM

Letters From Our Readers

Dear Editor:

I was absorbed in reading Wynn Rostek's excellent article in which he defined multi-tasking as two or more concurrent processes using different slices of CPU time. I got to page 215 and it said "continued on p. 316." But the remainder of Rostek's article was not there! Nor was it on page 216!

I resolved to continue my serial, page-by-page progress through *Computer Shopper*, figuring I would stumble on the rest of Rostek's article. It occurred to me this was a fine example of multi-tasking according to Rostek's definition.

If you think about it, humans naturally multi-task all the time, to an extreme degree. For example, my "to do" list represents a list of processes set in motion (through the planning process) but not yet complete. Each is suspended, waiting for execution at a later date. The list includes all sorts of errands as well as job-related tasks and memos for shopping trips and the like. My to do list runs to 3 pages, single-spaced, and it is constantly changing. Each individual task is hugely complex in information-processing terms, requiring full attention of my human CPU during parts of its execution.

Is multi-tasking important? Just consider how hamstrung you would be if you could do only one item from your errand list at a time, then you had to go home to retrieve another item. On my "to do" list errands are grouped according to category. When setting out on a voyage to town or office, I look at the list and do several errands which require traveling to the same location, so I can knock several items of my "to do" list in efficient fashion. That is common sense, isn't it? This resembles Rostek's description of multi-tasking as activating dormant processes (bringing them up from long-term memory), maintaining each in a ready-to-execute state, allowing each to snatch segments of CPU time when appropriate.

Having stopped my serial search through *Computer Shopper* for yet another task, writing this letter, I am left curious about whether Rostek's article is continued at all.

P.S. The remainder of the article turned out to be on page 361, suggesting a new algorithm for locating missing "continued on" pages: invert the last two digits.

Russ Dewey
Statesboro, Georgia

Dear Editor:

I'd like to thank you for presenting Mr. Rostek's article More On Multi-Tasking in the August issue. It was an accurate description of multi-tasking but I think it should have been placed in articles rather than the Atari ST section. There seems to be a great deal of confusion lately concerning what is and what isn't multi-tasking. A great example is Apple's claim of multi-tasking on the Macintosh with Multi-Finder. It doesn't take a degree in computer science to figure out that Multi-Finder doesn't multi-task at all (not sort of, not a little bit, not something like, not at all). Actually a simple examination of the hardware makes clear that the Macintosh isn't suitable for any reasonable form of multi-tasking.

It's unfortunate indeed that computer manufacturers seem to think it is in their interest to attempt to re-define standard terms and to intentionally mis-represent their products. As a result we have an entire generation of computer novices who discuss matters such as multi-tasking in terms gleened from manufacturers claims and then wonder why computer professionals don't agree with them.

Michael J. Barton
Barre, VT

Dear Editor:

I'd like to send KUDOs to Wynn A. Rostek for his excellent article "More On Multi-Tasking." I've been around computers long enough that he didn't say much that was new to me, but I found his article thought provoking and his points well thought out. I only wish it hadn't appeared under the Atari banner since many PC users could use a lesson on multi-tasking. As Mr. Rostek points out, many think being able to print one job while working on another is an example of multi-tasking. I had a print spooler on my single-tasking 1976 SWTP 6800! Though most all multi-tasking systems can print while doing other jobs, one shouldn't switch operating systems for that one feature. Doing two jobs at once (WordPerfect with Marble Madness for example) is true multi-tasking, but not very useful for a single user system.

I use multi-tasking operating systems on my Atari ST (OS-/68K and IDRIS). I seldom run two jobs at once, but often run several tasks to achieve a single goal. UNIX-like systems have interprocess communication in the form of pipes. Like several items mentioned by Mr. Rostek, pipes are not required to be part of a multi-tasking system; but they are a major reason small computer owners should consider multi-tasking. Pipes allow to you chain several programs together with the output from one being the input of another. For example I could search an address list for names within a range of zip codes, sort them by name, format them three across, and print labels all with one command line. This is done by "piping together" short programs like cat, sort, awk, mc, and lpr. Single tasking systems can still do these things, but must run each program separately saving the output of each program in a temporary file.

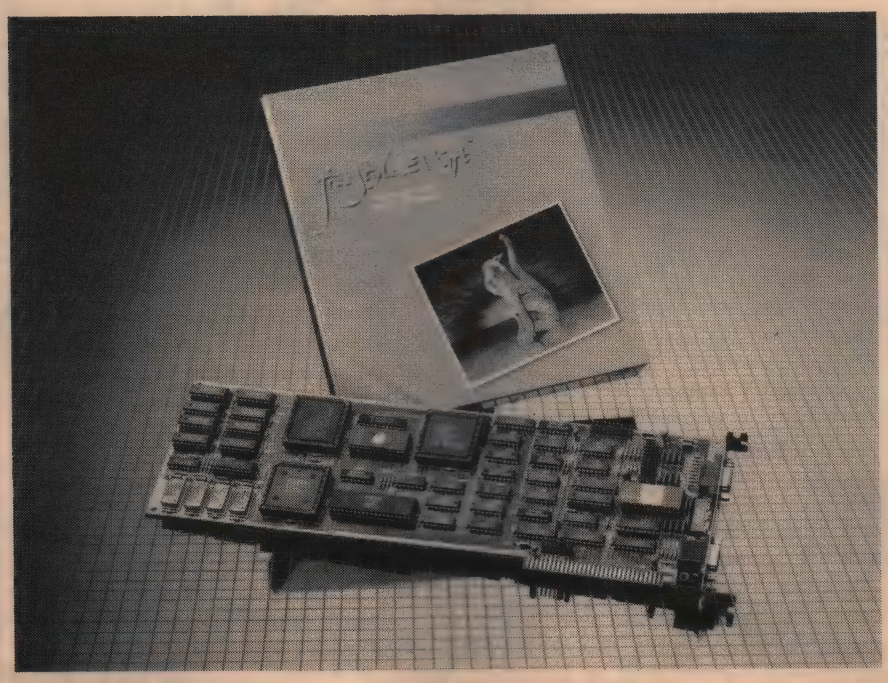
On the other side of the spectrum, the article "Atari To Release Fourth Edition Of TOS" by D.F. Scott has several errors. I have compared the article to a print out of a BBS message by Roy Good, and found the following errors:

1. Gem programs in "AUTO will not run," delete the word "not."

"...files that can inhabit a directory. One hundred was the prior limit."

continued on page 238

FreeStyle VGA Paint Package



Everex Systems, Inc. has announced the release of FreeStyle EVGA, a revolutionary graphic arts software package. Designed exclusively for Everex by Island Graphics Corporation, FreeStyle exploits special features of the Everex EVGA graphics adapter.

"FreeStyle is a sophisticated graphics package taken from the Targa environment and brought to the fast growing VGA market," said Eric Shealy, graphics product manager. "It's the first VGA package to provide features identical to Targa-type software which sells for over $1,000, but at one-third the price."

FreeStyle takes advantage of the EVGA's unique 256-color, 512x480 resolution. This special, high-resolution VGA mode is designed to maintain compatibility with the Targa video standard. Additionally, FreeStyle reads and writes images with the Targa file format. Together FreeStyle and the EVGA provide an inexpensive way to display and edit digitized images in Targa format, something never before possible with a standard graphics adapter. Now image database, business presentation, and graphic arts software can migrate to the EVGA platform while maintaining compatibility with the higher-end Targa market.

FreeStyle images can be used to enhance desktop publishing documents. A utility called XFORM, included with FreeStyle, converts images to 256-gray-scale Encapsulated PostScript (.EPS) or Tagged Image File (.TIF) formats. These images can then be brought into Ventura Publisher and PageMaker or printed on PostScript-compatible typesetting machines.

FreeStyle runs exclusively on the Everex EVGA. It has advanced graphic design tools that include fonts, custom shapes, color cycle animation, tinting and washing capabilities and a pixel blending feature to smooth jagged edges. Detailed image editing is made easy and accurate with a unique, hardware-based, instantaneous 2X zoom and a smooth panning feature. FreeStyle's suggested retail price is $299.

The Everex EVGA supports all 17 VGA modes and is compatible with EGA, CGA and Hercules. The EVGA provides extended graphics resolutions of 1280x600 and 800x600, extended text modes of 132x44 and 132x25, and comes with a complete set of software drivers for popular applications. The board has a suggested retail price of $399.

You may contact Everex at 48431 Milmont Dr., Fremont, CA 94538. In California (800) 821-0807, elsewhere in the USA (800) 821-0806. ●

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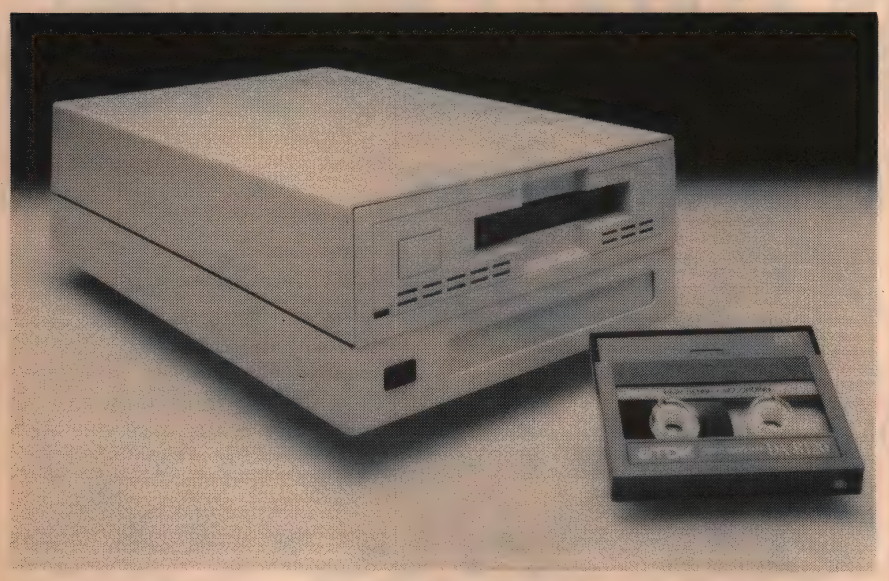

Digital Audio Tape DAT Backup

Alliance Technology, Inc., has announced the company's newest addition to its line of backup/archival products. Designated QA-600, the mass storage unit is based on the new generation DAT cassette format.

Offering an error performance 1000 times better than conventional cartridge-based backup systems, the QA-600 features a 600MB storage capacity. The product combines the new DAT cassette drives with advanced controller design and the industry standard SY-TOS tape operating system software. This combination yields fast data transfer rates and unprecedented file search speeds while preserving the SY-TOS logical tape format.

The QA-600 lists at just under $2000 and is packaged both as an external add-on for the PC/AT and PS2, and as an internal unit for the standard PC/AT or compatible.

Alliance is the first manufacturer to deliver the new DAT-based backup system in a 5¼" form factor with shipments beginning in fall of this year.

For additional information, contact Alliance Technology, Inc., 510 Lawrence Expwy, Suite 210, Sunnyvale, CA 94086; 408/727-6200. ●

Hauppauge Computer Works 386 Motherboard For PC/AT

Hauppauge Computer Works now has an AT version of the 386 MotherBoard which turns the PC/AT into a high speed OS/2 machine. The MotherBoard/AT will produce an overall performance upgrade of two and a half times, by upgrading a 6 or 8MHz IBM PC/AT to 16MHz 386 speed. The 386 MotherBoard/AT will also work on PC AT compatibles, such as the PC Limited machines.

The 386 MotherBoard uses the Award 386 BIOS, comes with four 16-bit and four 8-bit I/O slots, has a 32-bit RAM expansion connector, and can be expanded with up to 12MB of RAM. A high speed 16MHz 387 math coprocessor chip can be added to speed up math intensive applications, such as Lotus 1-2-3 and AutoCAD.

Recently, PC Link in Manhattan announced the release of PC Link 386, an 80386 16MHz, zero wait state computer based upon the Hauppauge 386 MotherBoard/AT. The new PC Link 386 computer, which retails for $2295, performs like a 21MHz IBM AT.

The 386 MotherBoard/AT retails for $1595 through Hauppauge's worldwide network of distributors and retailers.

For more information, contact Hauppauge Computer Works, 175 Commerce Drive, Hauppauge, NY 11788; 516-434-1600. ●

K-Talk Introduces New Math Editor

K-Talk Communications has introduced a new math editor software product, MathEdit.

MathEdit is a program which lets you construct complex math expressions to be inserted into documents. All equations are output in two formats: Word Perfect 5.0 (printed with Apple LaserWriter), and TEX. The equations created with MathEdit can thus be used with word processing and typesetting.

MathEdit's user-friendly interface features menus which "walk" you through each part of your equation, reminding you to close brackets and enter exponents, bases and limits when needed. The equations are automatically set in proper mathematical format, centered, balanced, and scaled.

The program has a display window which allows the math equations to be viewed as they are created. Hercules or EGA are recommended for optimum onscreen viewing.

MathEdit is an alternative to mathematical word processors. It is priced as $149 and runs on IBM, PC, XT, AT, or compatibles with 256K bytes of RAM and DOS 2.1 or higher. For further information, contact: K-Talk Communications, 50 McMillen Ave, Suite 100, Columbus, Ohio, 43201. 614-294-3535. ●

Letters From Readers
continued from page 237

There was never such a limit, I've had sub-directories with over 300 files. I suspect Mr. Scott confused Mr. Good's mention of the old limit on File Selectors.

3. "BIOS called #9," replace with "BIOS call #9."

4. "...40-folder limit to a disk directory has been absolutely positively destroyed," replace with "40-folder bug (opened per session) alleviated to the point of improbability."

Leo Taylor
Hamden, CT

Dear Editor:

The following letter is sent with the hope that someone reading it will manufacture a product which does not exist at present.

It is a cordless remote terminal, with the range similar to a cordless telephone, whose base station would be a plug-in board for a PC with a miniature transmitter and antenna. Screen information and audio would be transmitted to the remote, keyboard information back. Protocol and error checking would be in the hardware.

Then one could comfortably sit in a chair, or out by the pool, and run on a fixed and heavy PC anything that did not require disk changing. It seems a very modest product to engineer. There's an obvious market for it.

Daniel Eisenberg
Tallahassee, FL

Dear Editor:

Ralph Nottingham's letter caught my eye since I had a similar experience with a Microline 92. Despite light duty and Okidata ribbons I have gone thru two heads. The first time I sent the printer to the Okidata service center in New Jersey. They missed the failed head and offered to replace the main board for $200. A customer relations representative set me straight.

To quote your reply, "I will also state that Okidata is a very reliable manufacturer." You should read Okidata's most recent advertisements. They polled their customers asking what they wanted most from a printer. The answer was "reliability." Would Epson customers give the same answer? In the same ad, Okidata announces a new printhead for it's printers!

I would infer that Ralph and I are not the only Okidata customers suffering.

Ron Shepler
Big Rapids, MI

Dear Editor:

I pick up the *Computer Shopper* because I hear that there are articles on the Adam computer.

In the article you printed my name & address in Aug. 88 page 376. The problem is you printed my old address. My new address is
Philip Kosowsky
6067 Jerusalem Dr.
Cicero, NY 13041
(315) 699-6456

I work on the Adam CPU and printer only. I do not work on data drives or other peripheral. The cost of repair is a flat $50 which includes return shipping cost.

If you could, please put my current address in your next issue.

Philip Kosowsky
Cicero, NY

Dear Editor:

I am a subscriber to *Computer Shopper*, and surely find it helpful to keep up with what is going on in the computer world!

On re-reading the July 1988 issue, I noticed an article on page 286 titled "The Cockpit—Flight Simulator," by John Gibney. This article reviewed a new unit called the "Cockpit" by Novel Twist, Inc., which the article said had a price tag of $600.

I am interested in purchasing that item. However, the article did not say how to contact Novel Twist, Inc., and I have not seen that article in any computer stores in my area. I would greatly appreciate learning where I can purchase that item.

William B. Levin
Tacoma, WA

Answer:
Noveltwist Inc.
P.O. Box 2046
Melbourne, FL 32902

Dear Editor:

In response to John Hankins' (August '88, p. 178) letter regarding adding a hard disk to the IBM Portable PC, I have already replaced the B drive with a Seagate ST238 30MB hard disk. The PC Portable actually contains an XT motherboard rather than a PC motherboard (i.e., it has 8 slots and a 135 watt power supply, as opposed to the 5 slots and 63 watt power supply found in an IBM PC). IBM added the extra slots and bigger power supply to the XT's motherboard to accommodate the hard disk controller and the hard disk itself. Another significant difference is that the 11/08/82 BIOS installed in the Portable's XT motherboard already recognizes hard disks. The bottom line is that I don't believe Mr. Hankins needs a new BIOS.

But in case anyone else is interested, on page 298 of the August issue, Hi Tech Electronics advertised genuine IBM BIOS upgrade chips for only $25. Just one more thought, after I replaced my B drive, I found that I really did want to have that second floppy so I ended up buying a desktop AT-style case, moving the guts from the Portable over and adding the B drive back in.

In retrospect, a hard disk card might have been a cheaper solution since I could have left both floppies in place (but it does get tight inside the Portable and it is usually very difficult to find room for a hard disk card in addition to the other adapters). It is possible to save a slot by putting 640K on the XT motherboard (a minor modification) and by replacing the IBM floppy controller with a combination floppy controller/multifunction board.

I hope this information is helpful to Mr. Hankins and if he or anyone else is interested in additional information, I'd be happy to help if I can.

Jack Edelstein
Vienna, VA

●

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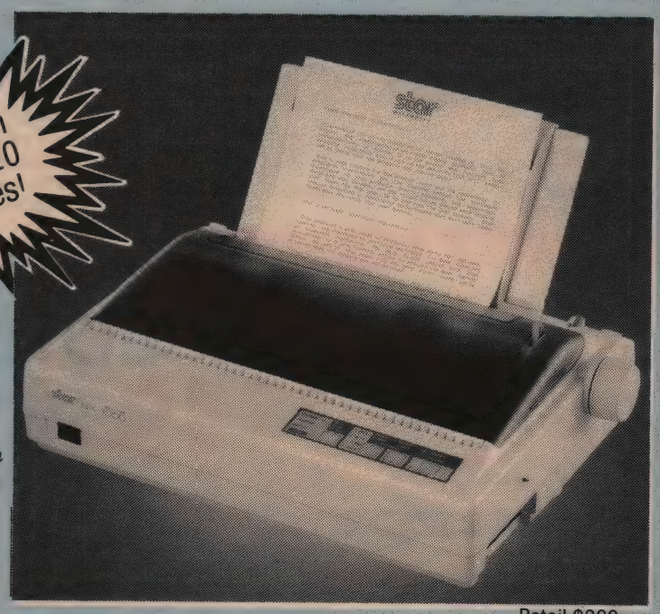

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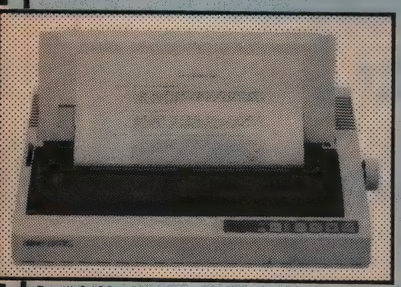

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Aldus PageMaker Version 3.0

by John McCormick

Desktop publishing is rapidly becoming a very important field, driving mouse sales as well as sales of high resolution monitors and laser printers, not to mention giving us a personal freedom of the press not even dreamed of in countries like Poland where it is illegal for anyone but the government to publish anything.

This is one area where Apple's Macintosh computers have clearly outshone the standard PCs, partially because every Mac comes with a mouse but mostly because the most powerful desktop publishing software was first implemented on the Macintosh; in fact, PageMaker was first released for the Macintosh in mid-1985, and that was basically the start of desktop publishing.

Desktop publishing involves word processing, graphics, page makeup, printer control, and more, with inexpensive programs like Unison World's NewsMaster and Timework's Publish-It! providing enough power for producing company newsletters and flyers, but these programs lack the power and sophistication needed to produce truly professional-looking results in a reasonable time.

Aldus PageMaker is intended for users needing fully professional features, and its features are concentrated in page makeup, or layout, just as its name implies.

Page makeup used to be mainly cut and paste work, done with real scissors (more likely X-acto knives) and paste, where the person doing layout actually cut printed text and graphics images to size and pasted them on a board to be offset photographed.

Many publishers and printers now use page layout software for this work, especially since desktop publishing software has come to the PC and Macintosh worlds.

With the introduction of PageMaker Version 3.0 for the IBM PC compatible computer market (it also runs fine on PS/2s), Aldus has bridged the gap between Macintosh and PC-based desktop publishing because Version 3.0 for the PC is nearly identical in features and user interface with Version 3.0 for the Mac.

Those of you who saw, read about, or even use PageMaker Version 1.x haven't missed Version 2.x; Aldus jumped to Version 3.0 to bring the Macintosh and PC versions in line with the same numbering since they are virtually the same program (the appearance and operating characteristics, not the code).

Documentation

PageMaker's documentation is among the best in the business, with every page providing a lesson in good document design, just by example.

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AldusPageMaker

The spiral-bound Getting Started provides a five-lesson step-by-step tutorial introducing the beginner to the design of everything from a simple one-page flyer to a folding pamphlet.

Installation is covered in a separate 40-page brochure, reducing the bulk and complexity of the introductory booklet.

I found that just handing the Getting Started booklet to a novice permitted her to start designing publications in a matter of a few hours, and with my limited desktop publishing experience I was cropping photographs, importing text, and creating complete documents within an hour or so.

A 335 page spiral bound, well-indexed User's Manual covers everything from design considerations, and an 18 page glossary for desktop publishing terms, to the creation of special effects like enlarging an initial capital letter for emphasis.

The 250 page Reference manual covers all the nitty gritty details about the program.

Changes And Additions

PageMaker isn't new to the PC scene, having been around since the beginning of desktop publishing, but, for all its power, it was awkward and rather slow, mostly because it didn't let you use predefined formats.

On earlier versions if you wanted all headlines to be italicized or 26 point high and bold, you had to go through the document, highlight each one individually, and hit F7 to change to italics or choose type specs from the menu and pick size and features from the pull-down box that appears.

Version 3.0 has added style sheets which let you predefine styles for every part of your document, automatically formatting headlines, subheads, and body copy for a consistent look across your entire document, greatly reducing your work, and likely improving the appearance of your finished work.

Both style sheets and templates can be user-defined, but Aldus provides 20 standard templates with the program, for such common printing jobs as price lists, newsletters, memos, proposals, calendars, speaker's notes, and overhead transparencies.

While style sheets define such things as font style and size for your document, templates store both style sheets and page formatting information such as the number of columns and margins.

Templates provide a standard grid for your document, along with text and graphics markers that make it simple to insert text and graphics page after page, with complete consistency.

For example, to produce a folded brochure printed on every page, you need only load the "brochure" template and click in your art and text in the marked locations, enabling even a novice designer to produce a complex brochure in a matter of minutes.

Updating publications has become much simpler with a replace function that lets you change text and graphics without modifying your page format.

You can now adjust contrast, intensity, and even the angle and density of dot patterns in bit-mapped graphics, for special effects or just to improve the quality of the image.

Autoflow and text wrap are important desktop publishing features that were missing from previous PC versions of PageMaker but have made their way into this release.

Autoflow causes text to move from column to column until the entire text file has been inserted (the new version also automatically creates new blank pages using the previous page's format).

Text wrap is what makes it possible to have text snaking around the borders

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Microlytics Announces New Definitions Dictionary

Microlytics, Inc. has added a comprehensive definitions dictionary and hyphenation system.

The first implementation of the new products is in MicroPro International Corporation's WordStar 5.0. The IBM PC version was scheduled to ship last month. Microlytics' 220,000-synonym Word Finder electronic thesaurus and 100,000-word Spell Finder spelling verifier/corrector are also included in WordStar 5.0.

Utilizing linguistic compression technology licensed from Xerox Palo Alto Research Center (PARC), Microlytics squeezed the entire definitions dictionary into a file of only 250K bytes. Previously, more than a dozen floppy disks or a CD-ROM product was required to store the same amount of information. In addition, Word Finder is compressed into 100K bytes, while Spell Finder occupies only 126K bytes.

The definitions dictionary is the result of over four years of development efforts. It provides concise definitions instantly for tens of thousands of words, including technical and mathematical terms, proper nouns and uncommonly used words. Examples of words for which definitions are provided by Microlytics' definitions dictionary are "abscissa," the x-coordinate of a point on a graph; "Jefferson," the 3rd U.S. President (1801-1809); and "obstreperous," noisy and unruly.

The hyphenator properly hyphenates all the words in the 100,000-word speller, as well as most other words. The product is based on nearly 25 years of work by John Fedako, who developed hyphenation algorithms used at newspapers across the United States, including *The New York Times*.

For further information, contact: Microlytics, Inc., Techniplex, 300 Main Street, East Rochester, NY 14445; (716) 248-9150. ●

Paradox OS/2

Reviewed by John McCormick

The promise of OS/2 is slowly being realized with applications programs like the OS/2 version of ANSA's (Borland) Paradox OS/2.

Paradox is Borland International's $725 relational DBMS (Data Base Management System) and it has been around for some time in the DOS version, but although the OS/2 version looks and works the same it is definitely not just a port of the DOS version.

One useful way of looking at Paradox is as a mirror image of Lotus 1-2-3; the programs have a similar feel and if Lotus is a powerful spreadsheet with limited database capabilities, Paradox is a powerful database with limited spreadsheet capabilities (see discussion of the calculated field later).

This is one of the most powerful programmable databases available for PCs, offering far more features than dBase III, with the ease of use provided by pull-down menus and a powerful Paradox Application Language (PAL) applications development language, as well as the Personal Programmer applications generator.

While the DOS version of Paradox was and still is a very powerful program, the OS/2 version takes full advantage of the extra memory available under the new operating system by running Paradox in the protected mode, making it more powerful than any DBMS program currently available running under DOS, at least until the long-delayed Oracle hits the market, if it ever does.

No matter what future developments there are in DOS database programs, it is unlikely that any will really approach the OS/2 version of Paradox, though more powerful programs will, of course, eventually come along running under OS/2.

Using the protected mode, Paradox OS/2 can be run in several simultaneous sessions or in one window, using multitasking "threads" to perform all the usual database tasks such as sorting, querying, indexing, and editing simultaneously, and even perform all these simultaneous operations on the same file!

Paradox running under OS/2 takes just about as long to perform most operations as the DOS version but does not slow down significantly when running several operations at the same time.

This means that, while you can search or index a large file in either version in about the same time, under OS/2 you can perform both jobs in nearly the same time, making the OS/2 version actually much faster, on average, the more intensively you use it.

Multiple Editing?

Just how can you edit, sort, and produce reports from the same file simultaneously?

This is a confusing notion, but one that you need not pay any attention to when running Paradox since it is entirely transparent to the user.

If you are working with a file that is being edited by someone else on a network, any changes to the data you are viewing on your screen will be automatically updated, changing while you are watching, but without any additional commands or operations on your part.

Of course, once a report is generated and is perhaps in a spooler waiting for its turn at the printer, it is no longer available for updating, but this is a minor consideration, not normally causing any problem.

Files can be locked so that unauthorized users can't make any modifications, just as with the DOS version, but this OS/2 version is the first to let authorized users modify files right while they are being accessed by others.

Penalties

Although there is virtually no speed penalty imposed under OS/2 for running several Paradox operations simultaneously, there is a hardware cost associated with Paradox.

Even though Paradox OS/2 doesn't require the OS/2 Extended Edition, or presentation manager, it still needs a minimum of 3MB RAM to run under OS/2. (Normally OS/2 Version 1.0 will load and run programs in only 1.5 or 2MB.)

You will also need a hard disk and a high-density floppy drive (either 5.25" or 3.5"), but these are already required for a minimum installation of OS/2 anyway.

The 3MB requirement is more important, because even 80386-based computers like IBM's Model 70 and Model 80 normally come with only 1 or 2MB of RAM.

I ran Paradox and Paradox OS/2 on a Model 70 I was testing, one with 16MB RAM and a 120MB hard disk, so I didn't come up against this problem, but my normal Model 80 (80386) only came with 2MB and I haven't yet installed extra RAM, so I wouldn't be able to use Paradox OS/2 even on this

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WinDOS: On Screen HyperText Reference For DOS Up To 3.3

Reviewed by Lon Andrews

Put the big reference manual for DOS on the back shelf! A new guy is in town and he is promising to really make the use of DOS easier for us all. WinDOS is not a help file for DOS but rather a complete reference manual available from the keyboard and from within your applications as a pop up.

A lot of us never reach for the full potential of DOS for a number of reasons—takes too much time to learn or look up a function, why get fancy when I can do it this way with just a few more steps? I don't have an updated manual, and so on. How often have you said or heard I didn't know you could...?

Having WinDOS on line takes all those reasons and makes them obsolete. I am not sure yet if it will do the same for my DOS manual but it will get a heck of a lot less use now that I can press a hot key and read the manual on the screen.

"WinDOS provides structured documentation using a flexible combination of three database architectures: Relational database techniques allow rapid retrieval and cross referencing of the text; Hierarchical structures organize the information into main and subsidiary articles, so the user can tailor his/her reading efficiently; Network pointers unify text articles into a coherent manual." This is quite a mouthful even said fast. No matter how you say it this statement sets a pretty high target to hit. WinDOS surpasses the target and then some!

Window Book, Inc. prepares this same type of reference for industry and, as far as I can see, they are doing a bang up job. It makes sense to use the best technology available to train workers. A lot of time is saved if the information necessary is available on the screen instead of having to shift gears and use a reference manual.

WinDOS installs in its own directory and can be run as a pop up using a hot key from within an application. So far there is nothing special. When you run the program the tremendous job that Window Book has done is obvious very quickly. A short tutorial is all the instruction that you will need to use WinDOS and that isn't really necessary if you are willing to look around a bit. The total documentation on paper is limited to two ½ sheet sized pages that cover installing the program and how to activate it once installed. Since WinDOS is a manual, all the operation of the program is covered in the tutorial on screen.

Operation of the program is surprisingly simple. ALT-ESC serves as the hot key to activate WinDOS from within an application or from DOS. Once the program is up, there are only six control keys that need to be used and these are prompted in most cases.

All good manuals have a table of contents and WinDOS is no exception. The Table of Contents is accessed from the program by using F2 to take you to the top of the Table. The WinDOS manual is divided in to 10 sections—Preface, Introduction to DOS, Quick Reference, Keyboard Controls, Files, Places and Names, DOS Commands, Redirection and Filtering, Batch Control Language, DOS Concepts, and Tutorial: How To Use WinDOS. There is also a complete Index that is presented alphabetically rather than categorically so you can find your subject either way.

WinDOS uses a true hypertext technology that allows the use of cross referencing to allow accession of materials related to the topic that you are reading. These cross references are developed by the author(s) of the text in the program being used. Described by some as "lightning fast" this process will amaze you with its speed and ease of use. With my 286 AST running at 10MHz there is no noticeable delay when cross reference is selected until the related text appears.

I am no stranger to using DOS but I find that I am becoming much more at ease with DOS. Having the manual right in front of me all the time has prompted me to develop my usage of DOS to encompass command that, while I knew they were there, I hardly ever used because I could not remember the syntax. Now the syntax is right there on the screen.

The one recommendation that I would make has been taken care of in the next release. I would like to see a half screen display so the information could be displayed after you go back to DOS or to your application. This would allow the data to remain on the screen and the operator would not have to take notes or rely on memory. The version of WinDOS that I am currently using is the Beta test version of the next release that will be out by the time you read this article. This version will have the split screen feature.

WinDOS is the equivalent of a 250 page manual for DOS and is equipped with 1, 783 cross references. All of this is compressed onto a single 360K floppy. This has to make Window Book, Inc. the "king of compressing data!"

Any of the articles in the WinDOS manual can be sent to your printer if you desire by selecting the print option. If you feel the need for the printed word it is available at the stroke of a key.

To find information in WinDOS you can either use a structured reading or a cross reference follow up to what you have selected. Structured reading takes you through the selection to its end. Cross referencing lets you jump onward through the various related subjects. This presents a more detailed method of learning DOS than the printed manuals that are not so hot in listing related subjects. WinDOS presents a logical train of thought that you can pursue with little or no effort.

A quick trip in WinDOS to check out CHKDSK would look as follows: ALT-ESC brings up the program. Using PgDn find and highlight CHKDSK. Select READ and the main article appears on the screen. Using the cross

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Paradox OS/2 continued from page 243

$8,000 system as it came from IBM.

Paradox DOS And OS/2

One important feature of the OS/2 version is that it not only looks the same as the DOS version, it is 100% compatible with both data files and applications written for Paradox 2.0 and Paradox 386.

The function key templates that come with either version are identical and do not support either F11 or F12, but this is no problem because Paradox is remarkably easy to use for such a powerful program, and only seven of the F1 to F10 keys even have Alt + key assignments, with F1, F2, and F10 having only a single function each.

The Lotus-like command line at the top of the screen has a list of commands with an additional explanation of each highlighted command on the second line.

Invoking a command by highlighting it and pressing <ENTER> either brings up another menu of options or presents a request for a specific item such as the name of a table, with a list of possibilities as near as another keystroke.

These are not pull-down menus, so they lack the polished look of that interface, but just because they look a bit old-fashioned doesn't lessen their usefulness.

In many ways Paradox is the odd man out among the popular database programs because it uses tables for practically everything, then relates information between tables. This is actually one of the requirements of a relational database, and one that nearly every other PC-based database program you can name either ignores or only partially implements.

Many programs store data in tables, but Paradox also places your queries in tables, as well as data being entered, and other things. There are even tables showing the structure of other tables.

This reliance on tables increases Paradox's capabilities, but it also penalizes users by forcing them to use several steps to do the same job (such as selecting records, performing a sort, and printing a report) that might take only one step with another database program.

Programming Paradox is a bit more complex because of these individual steps, but because of the table structure, once the steps are programmed into a procedure, Paradox will run as quickly as most programs, with times comparable to or faster than dBase for sorting and report generating.

To balance things up, some things are quite easy to do with Paradox, for instance if you are creating a new file, the field types (alphanumeric, decimal or integer number, date, and currency) are easy to select from a menu, and you can even change them later without problems.

If you do try to make a change incompatible with already recorded data, Paradox warns you of the problem before accepting any data-damaging instructions.

Paradox will also automatically create data entry screens based on the field names and types you have entered, or you can define up to 15 custom forms for each data table you have specified.

Querying tables can be very simple once you understand just how simple it can be. First, select a table and choose the fields you want to work with, then insert "examples," thus creating your own query table. Just push F2 (DO-IT!) and Paradox will create a third table with the results of sorting the original data using the query table you have created.

Last, but certainly not least, Paradox can import and export many popular database and spreadsheet format files: Lotus, Symphony, dBase, PFS File, VisiCalc (DIF), and ASCII.

Documentation

As far as I could tell, except for a single page of special OS/2 information, the documentation for the DOS and OS/2 versions of Paradox 2.0 is identical, that is to say, nearly perfect!

Borland has built a company on providing inexpensive programs and excellent documentation and, although Paradox might not seem inexpensive at first glance, remember dBase III and Clipper are only $30 less, and these are far from the most expensive of the programmable databases.

The documentation is Borland's usual well-indexed bound books, with a 580-page *PAL User's Guide*, a 560-page *User's Guide*, a *Personal Programmer Guide* of 140 pages, a 75-page *Network Administrator's Guide*, and, to ease the transition, an easy to understand 200+ page *Introduction to Paradox* that

continued on page 341

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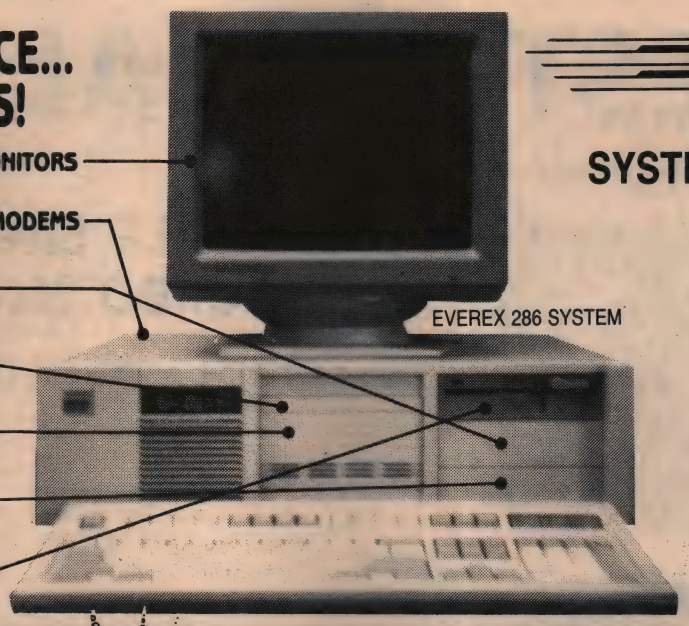

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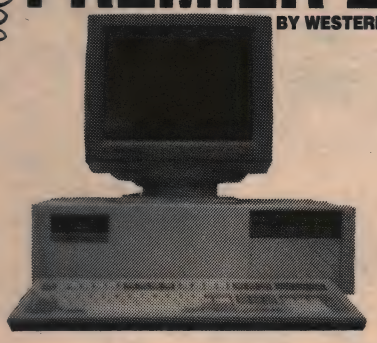

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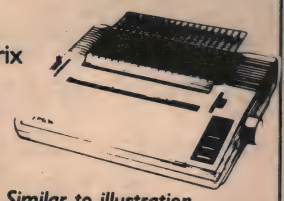

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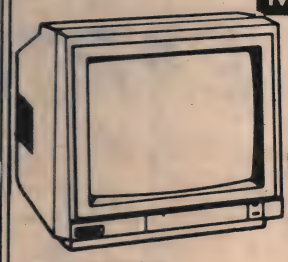

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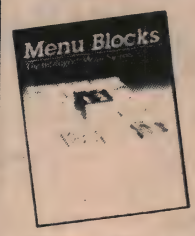

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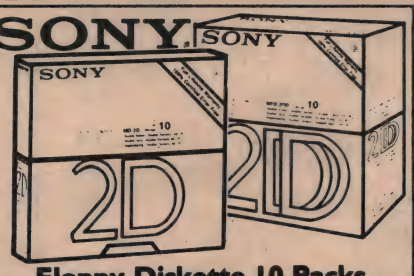

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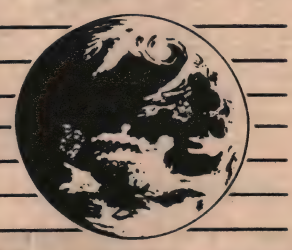

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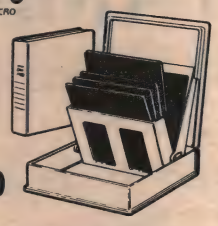

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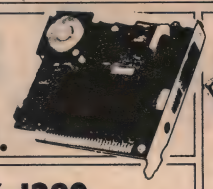

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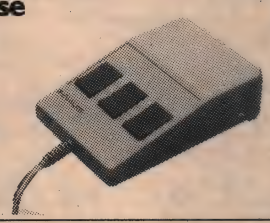

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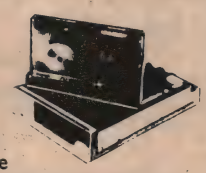

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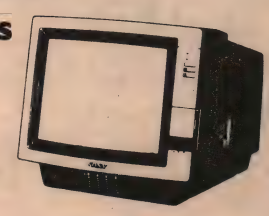

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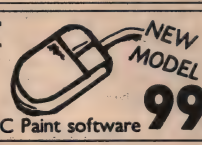

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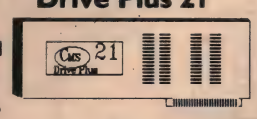

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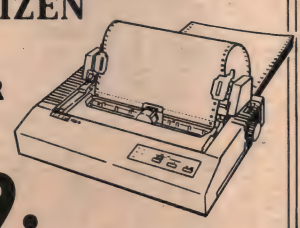

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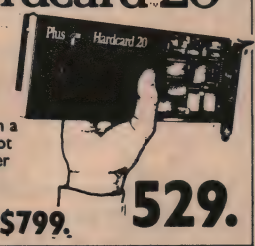

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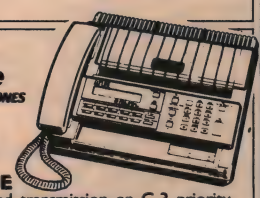

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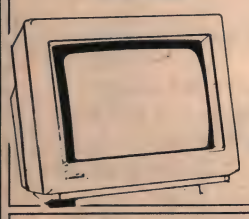

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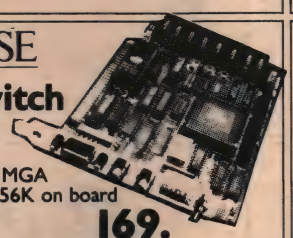

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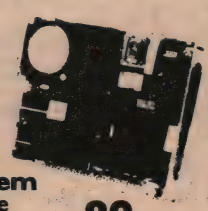

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		Condensed	*14x9	137	17	70
	Near Letter Quality	Pica	*24x18	80	10	20
		Elite	*12x18	96	12	24
Italic Cursive Character	Standard	Pica	*16x9	80	10	100
		Elite	*16x9	96	12	50
		Condensed	*18x9	137	17	70
	Near Letter Quality	Pica	*32x18	80	10	20
		Elite	*32x18	96	12	24
Graphic	Single Density Graphic		nx8	480 dot column	—	600 dot column
	Double Density Graphic +		nx8	960 dot column	—	490 dot column
	Double Speed, Double Density Graphic		nx8	*960 dot column	—	600 dot column
	Quadruple Density Graphic +		nx8	*1920 dot column	—	*980 dot column
	640 Dot Graphic		nx8	640 dot column	—	326 dot column
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* Indicates that the specified figure includes half dots
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APPLE

Connecting C And The Apple

by Joe Schell

The C language is meant to be portable between machines. However, Apple programmers have gotten used to doing things on the Apple IIe which are done only on the Apple. It can be especially frustrating to try to convert a BASIC program to C because of this. The two main problems are in directly accessing peripherals (keyboard, joystick, etc.) and in manipulating strings.

Strings in BASIC and C are substantially different. Mainly, there is no guarantee that the result of a C string function will actually be a string. C strings are only considered to be strings if they are terminated by a null ('\0') character. But C string functions do not necessarily put that null at the end of a result.

This is actually necessary in C as the function does not know that the programmer has supplied enough space for the result and the null character. The following functions do assume that enough space has been provided.

The following functions are found in BASIC string.c. In all of these, src represents the source string and des is the destination string. The source string src is never changed. All of these functions handle values that would be outside of the string. Also these functions, except strfnd(), return des as the return value.

strrgt(src, n, des):

This returns the right-most n characters from the string src in the string des. For example, strrgt("abcdef", 3, des) would return with des = "def". If n is larger than the length of src then des will be the same as src.

strlft(src, n, des):

Like strrgt() except it returns the left-most characters. For example, strlft ("abcdef", 3, des) would return des = "abc".

strmid(src, p, n, des):

This returns n characters starting at position p in src. For example, strmid-("abcdef", 2, 3, des) would return des = "bcd". Note that p starts with one as "a," two for "b," etc. If p is outside of src then the null string is returned.

strinsrt(src, des, ins, p):

This insert ins into src before position p and returns the result in des. For example, strinsrt("abcdef, des, "--", 4) would return des = "abc--def". If p is too large then ins is appended to the end of src.

strfnd(src, f):

This returns the position in src where the string f can be found. It returns zero if f is not in src. For example, strfnd-("abcdef", "bc") would return 2. This function is useful in any of the functions that require a position.

This is not the same as the C function strstr() which returns a pointer, not a position.

strrpl(src, des, rpl, p):

This replaces the characters at position p in src with the characters in rpl and returns the result in des. For example, strrpl("abcdef", des, "--", 4) would return des = "abc--f". The result in des will never be longer than the original src regardless of the length of rpl or what value p takes.

__ncpy(s1, s2, n):

This is the same as the C function strncpy() except it always appends a '\0' to the result(s1). It could directly replace strncpy(), but to maintain compatibility it has been named __ncpy() and is intended for use only inside of basicstring.c.

At the end of the file basicstring.c there is also a debug routine which can be used to test these routines. It is used by compiling basicstring.c with the macro DEBUG defined (used option —DDEBUG on the Aztec C and C' Prime compilers) and then linking and running the result.

The next file is called appleio.c. It contains a variety of routines used to access all of the input devices. For the keyboard, this eliminates the overhead of files. And other input devices, like the joystick, are not accessible through C files.

It might be necessary or desirable to write original routines rather than using the ones in appleio.c, so the necessary parts are in appleio.h. By including that file, the following will be true.

keybd: keyboard buffer.

This is used like any other C variable of type char. However, in actual use it will only be used as a constant, in other words, it shouldn't have values assigned to it. When the value of this is greater than 127, then a key has been pushed. The key value is then keybd-128. Use keyclr to clear the buffer.

keyclr: clear keyboard buffer.

This is used like any other C constant (1, "a," etc.). However, anytime it is used it clears keybd.

bttn(n), open__apl, clos__apl: Buttons and apple keys.

Like keyclr, these are treated as C constants. If bttn(n) is not zero, then a paddle button is being pushed. The value for n can be from zero to two. Open__apl and clos__apl represent the open-apple key and the closed-apple key respectively. If they are non-zero, then the key is currently being pushed.

ann__on(n), ann__off(n): Annunciator switches.

These aren't used very often. However, operation is simple; ann__on(n) turns on the nth switch and ann__off(n) turns it off. The value for n can be zero to three. These are used like C constants.

The routines that use these macros are found in appleio.c and are defined as follows.

key():

This returns the value of a key if one has been pressed. If no key has been pressed then the return value is −1.

key__clear():

This clears the keyboard buffer. It is sometimes useful to clear the keyboard buffer before calling key(). This eliminates spurious keypresses.

key__apple(&key):

It is often useful to use the open-apple and closed-apple keys as function in-

continued on page 253

Ask The Guru

by Don Lancaster

No good deed shall ever go unpunished.

Bob Sander-Cedarlof has ceased publishing his great *Apple Assembly Lines*, which was one of the finest Apple magazines anywhere ever. It seems that Bob finally let a few frivolous matters of food, clothing, and shelter get in his way. Bob does have a bunch of back issues and whatever available. Once gone, they are gone forever. You might contact him directly for more information.

Steve Ciarcia is leaving *BYTE* to go whole hog on his own already great *Circuit Cellar Ink* magazine. His final November and December *BYTE* columns are absolute mind-blowers that involve a parallel processor that produces Mandlebrot fractal images in near real time!

Which means it passes a Cray-1 like it was sitting up on blocks.

Apple has finally addressed the disk drive blowup problems on the IIgs. If you ever do experience any difficulties with both drives coming on at once or have similar hangups, see your dealer for a free change of your disk drive internal I/O board.

Let's see. Apple now has two new videos out, a user group one on Woz talking about me, and one on desktop publishing and communication solutions. There is also a new Desktop Solutions portfolio that goes with the second video. See your user group for more details.

Two publications included here are the fat *Apple Desktop Communications Solutions Reference Guide* and their DeskTopics newsletter. Be sure to check these out.

As usual, you can get a list of all of your local user groups by calling (800) 538-9696, Extension 500.

The PostScript bulletin board that was previously at (409) 244-4704 is going through some reorganization difficulties. It should shortly reopen in a major city with a new number, a larger hard disk, multiple lines, and both Telenet and Tymenet access.

While you are waiting, you might want to check out a brand new PostScript board at (707) 882-2390.

U.S. Patent #4740443 shows you how to implant carbide teeth onto your toner particles so you can now scratch and grind up all of your laser printer cartridge drums. Guess which company it was issued to?

For this month's lukewarm stock tip, Seagate Technology had recently overexpanded a tad and the institutions have all pressed their collective panic buttons. An institutional investor would now rather carry AIDS than SGAT. Buy at $8; sell at $18.

There have been a dozen minor corrections to the gonzo justify we looked at last month. I've also now added custom kerning, tabs, and an improved compile to the routines. Call or write for a free printed copy.

Volume II of Ask The Guru is now shipping. This is a complete rewrite including lots of new material, a big master Names and Numbers section, and a full index. Besides all of the Apple and PostScript stuff, the text is also a tour-de-force of personal book self-publishing.

As per usual, this is your column and you can get tech help and some off-the-wall networking per the Need Help? end box. And now...

What Computers Do You Actually Use?

About a dozen of them, I'd guess. But my main machine is now a cross between a IIe and a IIgs running a fast ProDOS 8 and driving a LaserWriter NTX. AppleWriter and WPL are run on this machine virtually all of the time.

Bee has a IIc (she actually likes that insidious keyboard) driving a LaserWriter Plus with a modem for her personal workstation. Software here includes AppleWriter, production copy utilities, accounting stuff, and some weaving goodies.

Our book-on-demand production setup is a IIgs once again driving a LaserWriter Plus. Sadly, that 15:1 per-page toner cost penalty on the NTX prohibits us from using it here. Instead,

continued on page 252

Random Numbers And Dice

by Joe Schell

I have been playing board games for years and have always been curious about the use of dice in various games. In particular why do so many games use more than one die? Instead of using three six sided dice to get a number from three to eighteen why not use a single die that has sixteen sides numbered three to eighteen?

I must admit that this wasn't a burning issue. However, the answer is so simple and seems that it could be so useful that I thought a demonstration of the principle was needed.

As far back as I can remember I was always graded on "The Curve" in school. And for almost as long as that, I had no idea what the curve was. Frankly, I suspect that many of my teachers didn't really know what the curve was either. They just plugged numbers into an equation and got an answer.

Actually, the curve is usually called the Normal Distribution Curve. In relation to people that means that most people are average. A few are worse than average and a few are better, but most are average.

For the most part, the Normal Distribution Curve has little use for me. The only reason I remember it at all is because I am always looking for the perfect game. For me the perfect game is one in which the computer plays my opponent and does it in such a way that it appears to be another person.

Most games however, seem to lack normal opponents though. I usually end up fighting (or competing) against either impossible creatures or really wimpy ones. There has got to be a hamster in the world, somewhere, which would go for my jugular given half a chance. And there is probably a grizzly bear out there that would follow me around like a puppy dog. Yet most hamsters are timid and grizzlies aren't.

But in most games the monsters (or other opponents) are always predictable. So predictable that the games all too often become boring. This is because monsters are generally created in two ways. The first way the monster is always the same. The second is that the same sort of monster is vastly different every time it is encountered. For the second type of monster a straight random number is used to generate how strong it is. This makes it equally likely that a monster will either be average, very strong or very weak. This just isn't the way the real world works.

The problem is that a straight random number doesn't produce a curve. It actually produces a straight line. However, when I look at three six sided dice I see a curve that looks very much like a curve. The program called PLOT.THREE.DICE produced the curve shown in Figure 1. Actually any three

continued on page 398

Run for PLOT.THREE.DICE
Figure 1.

```
 3: 1    ! *
 4: 3    !   *
 5: 6    !     *
 6: 10   !       *
 7: 15   !         *
 8: 21   !           *
 9: 25   !             *
10: 27   !               *
11: 27   !               *
12: 25   !             *
13: 21   !           *
14: 15   !         *
15: 10   !       *
16: 6    !     *
17: 3    !   *
18: 1    ! *
```

PLOT.THREE.DICE

```
10  REM  *** PLOT.THREE.DICE ***
20  REM  A plot of the sum of three dice.
30  HOME : DIM A(18)
40  FOR X = 1 TO 6
50  FOR Y = 1 TO 6
60  FOR Z = 1 TO 6
70 A(X + Y + Z) = A(X + Y + Z) + 1
80  NEXT : NEXT : NEXT
90  FOR X = 3 TO 18
100  PRINT X": "A(X)"    "; RIGHT$ ("  !",1 + (A(X) < 10) + (X < 10)); SPC(
          A(X))"*"
110  NEXT
```

Ask The Guru
continued from page 251

I am still stuck with one of my ancient 400,000 copy LaserWriter Plus machines.

At first glance, some of this may seem a tad on the wimpy side. But note that I can run portions of my PostScript book production routines as much as one hundred times faster than can a novice user running their canned application programs on a Macintosh II.

For instance, a very fancy three column gonzo-justified page having two figures, a header, and a footer, needs a mere zero to four seconds of extra page composition time above the NTX "full tilt" printing speed.

I very much prefer a computer in which I can understand and freely modify each and every level of hardware and software in the machine to suit myself.

Yes we have a Mac. It is used once a month to handle our PostScript disk production and translations. Otherwise, it serves as a handy doorstop, and Orville the cat sure does like to sleep on it.

Kathy, who runs a service bureau down the street, uses a IIgs and a II + to do our order processing, shipping label printing, and all our mailing list maintenance. Clone translations and production are done across town, and the Atari stuff is handled by a Tucson caver via modem.

I also still do use six of the KIM-1 computers, one of which does have a full video and EPROM burning capability. To this day, there is no finer computer to teach the fundamentals of machine language programming. I personally feel that the KIM-1 was the best computer that Commodore ever built, and sure would like to see it reissued.

Finally, since my personal computer collection is so skimpy, I am building up some of my own. These do include a little battery powered $50 control computer using that great Mitsubishi M50734. The M50734 is a latter-day 6502 that does include such built-in goodies as 40 I/O lines, 257 accumulators, four A/D converters, two stepper motor drivers, a watchdog circuit, four timers, a UART, a pulse position modulator, and a soft ice cream dispenser.

What's The Difference Between The Old And New IIe and IIgs Game Paddle Connectors?

The original Apple II and II + had a game paddle connector that consisted of an ordinary 16 pin DIP socket on the motherboard. Which had the dual disadvantages of the game paddle or joystick pins that were really easy to break, and that you had to remove the lid of your Apple every time that you wanted to plug or unplug your paddles or joystick.

The full sixteen pins did give you four game paddles or two joystick inputs, three pushbutton inputs, four annunciator outputs and a strobe output signal. A secret fourth pushbutton input was available if you did look around for it hard enough. Hint: override the cassette input at the output of its op-amp.

Figure 1 shows you this "old" game socket and its connections.

With the IIc, a "new" 9 pin DB-9 back panel connector was introduced.

continued on page 396

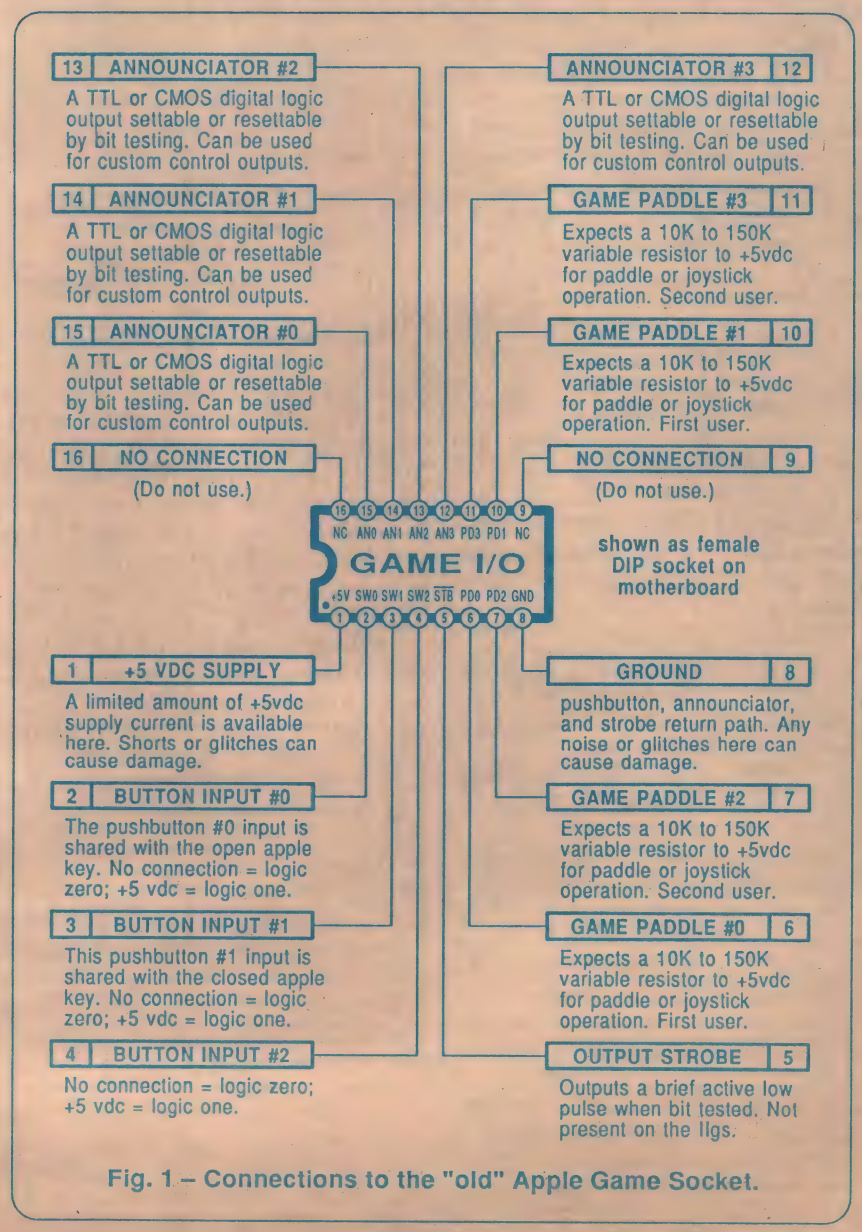
13 ANNOUNCIATOR #2
A TTL or CMOS digital logic output settable or resettable by bit testing. Can be used for custom control outputs.
14 ANNOUNCIATOR #1
A TTL or CMOS digital logic output settable or resettable by bit testing. Can be used for custom control outputs.
15 ANNOUNCIATOR #0
A TTL or CMOS digital logic output settable or resettable by bit testing. Can be used for custom control outputs.
16 NO CONNECTION
(Do not use.)
1 +5 VDC SUPPLY
A limited amount of +5vdc supply current is available here. Shorts or glitches can cause damage.
2 BUTTON INPUT #0
The pushbutton #0 input is shared with the open apple key. No connection = logic zero; +5 vdc = logic one.
3 BUTTON INPUT #1
This pushbutton #1 input is shared with the closed apple key. No connection = logic zero; +5 vdc = logic one.
4 BUTTON INPUT #2
No connection = logic zero; +5 vdc = logic one.
ANNOUNCIATOR #3 12
A TTL or CMOS digital logic output settable or resettable by bit testing. Can be used for custom control outputs.
GAME PADDLE #3 11
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. Second user.
GAME PADDLE #1 10
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. First user.
NO CONNECTION 9
(Do not use.)
16 15 14 13 12 11 10 9
NC AN0 AN1 AN2 AN3 PD3 PD1 NC
GAME I/O
+5V SW0 SW1 SW2 STB PD0 PD2 GND
1 2 3 4 5 6 7 8
shown as female DIP socket on motherboard
GROUND 8
pushbutton, annunciator, and strobe return path. Any noise or glitches here can cause damage.
GAME PADDLE #2 7
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. Second user.
GAME PADDLE #0 6
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. First user.
OUTPUT STROBE 5
Outputs a brief active low pulse when bit tested. Not present on the IIgs.

Fig. 1 – Connections to the "old" Apple Game Socket.

Connecting C continued from page 251

dicator keys. For example, in Appleworks simultaneously pressing the open-apple key and the "P" key brings up the print menu.

Any key down (besides the apple keys) will be returned in the variable key. The return value for key_apple() would then indicate what apple keys had been pressed also. If the return value is −1 then no key (apple or otherwise) has been pressed, if it is 0 then no apple key was pressed, if it is 1 then the open-apple key was down, if it is 2 then the closed-apple key was down and if it was 3 then both apple keys were down.

apple():

This returns a value for each of the possible combinations that the apple keys might be pressed. The return value will be zero for no apple key pressed, 1 for the open-apple key, 2 for the closed-apple key and 3 if both are down.

apple_open():

This returns non-zero if the open-apple key is down.

apple_closed():

This returns non-zero if the closed-apple key is down.

key_arrow(&h,&v):

In many applications that require movement on the screen, that movement can be controlled by the arrow keys. This routine facilitates that process.

The return value from this will be of three types. If it is −1 then no key has been pressed and if it is not zero then the value is of the key that has been pressed. If it is zero then h and v will correspond to the horizontal and vertical displacement of the arrow key. For instance, a right arrow would return h = 1 and v = 0, which corresponds to moving one to the right on the screen.

For some applications it might be necessary to change the values of the displacement, either by changing the value and/or the sign.

paddle(n):

This returns the current value for the paddle n, where n can be zero to three. A paddle can have a value of one to 255.

button(n):

This returns non-zero if the nth button is down.

joy(n, &x, &y):

This returns the x and y coordinates of the nth (zero or one) joystick. If n is out of range the return value will be −1.

joystick(&x, &y, &b1, &b2):

Most Apples use only one joystick and make use of both of the buttons on it. This routine returns the values from that joystick. The position values are returned in x and y and the button values are returned in b1 and b2.

annun_on(n), annun_off(n):

These turn the nth annunciator switch on and off. If n is out of range then −1 is returned.

As in basicstring.c, appleio.c comes with its own debugging routine. To use it, compile it with —DDEBUG and then link it with the main library and run it. It provides all of the feedback necessary to locate errors in the code.

Although all of these routines are useful, building libraries with them will require some additional work. First, each routine would have to be put into its own file. And then some attention would have to be given over to ordering them so that the linker can use them effectively. ●

```
                        basicstring.c
/*****************************************************************/
/* basicstring.c                                      4/1/88     */
/*              Basic string functions.                          */
/*---------------------------------------------------------------*/
/*                These routines are meant to act like comparable*/
/*              string functions in Basic.  The result will always*/
/*              be a null terminated string.  This is unlike normal*/
/*              C string functions which do not necessarily append*/
/*              a null to the result.  In some cases this might  */
/*              mean that the result is actually one longer than */
/*              expected to hold the null.                       */
/*****************************************************************/

/*---------------------------------------------------------------*/
/* strrgt(src, n, des)  Returns right-most n characters of string*/
/*                      src in string des. If n=0 then des will be*/
/*                      a null string.  The return value is des. */
/*---------------------------------------------------------------*/
char *strrgt(src, n, des)       register int n;     char *src, *des;
{
    return( _ncpy( des, src + strlen(src) - n , n) );
}

/*---------------------------------------------------------------*/
/* strlft(src, n, des)  Returns left-most n characters of string */
/*                      src in string des.  If n=0 then des will be*/
/*                      a null string.  The return value is des. */
/*---------------------------------------------------------------*/
char *strlft(src, n, des)       int n;  char *src, *des;
{
    return( _ncpy( des, src, n) );
}

/*---------------------------------------------------------------*/
/* strmid(src, p, n, des)   Returns n characters in string des   */
/*                          starting at p position in string src.*/
/*                          If n=0 or p is outside src then des is*/
/*                          the null string.  The return value is*/
/*                          des. p goes from 1 to length of src. */
/*---------------------------------------------------------------*/
char *strmid(src, p, n, des)    register int p,n;    char *src, *des;
{
    return( ( p > strlen(src) )
            ?   (*des = '\0', des)
            :   _ncpy(des, src + p - 1, n ) );
}
```

continued on page 393

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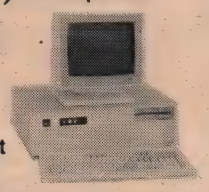

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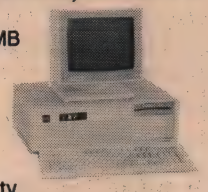

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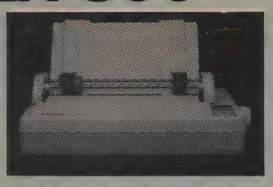

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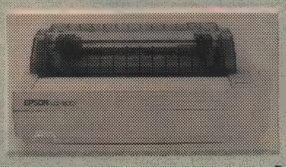

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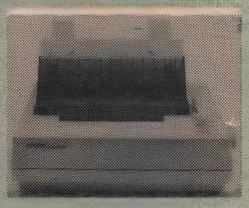

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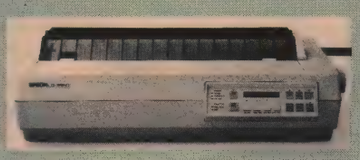

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MacWorld Expo Was Worth The Ransom!

In Boston, you don't pay cab fare, you rather pay ransom to a terrorist driver who has held you hostage from the Bayside Center or the Wang Center to or from the World Trade Center (the three locations for MacWorld Expo held August 11-August 13th). Upon payment of the ransom, you are let out of the cab into 96° heat and, if you are entering the Bayside Center, find that it's not all that much cooler inside the Exposition Hall (the air conditioning did improve toward the end of the week). The traveling back and forth from place to place in the grasp of crazed terrorists or charted ferry buses which leave when full is necessitated by the fact that the Expo has gotten too big for any one Boston convention hall. The chaos continues into the evening when Expo attendees, strewn all over the city in various motels and hotels, attempt to converge on one or more of the overcrowded, unbelievably noisy vendor parties held in restaurants and discos throughout Boston. Sounds awful, huh? It was wonderful!! Any reader who has not been to a MacWorld Expo should certainly attempt to get to one of the three to be held in 1989 (San Fransisco—January 20-22, Washington—April 26-28 & Boston—August 10-12). We know that prior attendees need no such urging.

The year Of The Scanner?

If MacWorld sets the scene for the rest of the year, 1988-89 will be the year of the scanner. While Apple's own Scanner, introduced at MacWorld, received most of the attention and press coverage, units from Hewlett-Packard (mentioned in this space last month), Dest and Abaton all attracted considerable attention. Additionally, one of the software hits of the exposition was "OmniPage," Caere Corporation's Optical Character Recognition product which allows pages of text to be read as text and, thus, be useable by a word processing or spreadsheet product (this method of scanning differs from the type of scanning done by products like Hewlett-Packard's "DeskScan" discussed last issue which scan in a graphics or bit-mapped mode; a mode that allows use of the images in a word processing system as a graphic but not as editable text). Software such as OmniPage will also close one of the loops on the FaxModem. Many non-FaxModem owners don't realize that material received in this manner is received as a bit-mapped graphic and, therefore, cannot be edited by a word processor thus negating one of the most desirable features of this type of transmission—the ability to receive a document via Fax, make changes and Fax it back. With OCR software in place, the faxed material would be printed and then scanned back into the system as a readable text file. This procedure may sound convoluted but it can be of great benefit to anyone editing other people's work. In subsequent issues, the *Computer Shopper* will carry in-depth reviews of some of the scanners shown at MacWorld Expo.

Happy Birthday HyperCard

MacWorld Expo marked the first anniversary of the introduction of HyperCard and there were many MacWorld events related to this celebration. There was an entire "HyperCard Mini-Conference" held at the Wang Center For The Arts, a splendid high-tech auditorium holding over 1000 with large projection screens on which the speaker, computer screen and/or video projection could be seen. The mini-conference was hosted by Jan Lewis, co-editor of *HyperAge Magazine* and featured such speakers as John Sculley, Bill Atkinson, Bill Gates, Jean-Louis Gassee, Alan Kay, Guy Kawasaki, Dan Shafer, Danny Goodman and Bill Campbell.

A personal view of my trip to the MacWorld

LUKE McMULLEN

At the mini-conference, the male half of your tour through the MacUniverse chaired a panel of HyperCard developers discussing the use of HyperCard in a multimedia environment. As part of the panel's presentation, Bonnie MacBird, author of the screen play for the movie *Tron* showed some laser disk & videotape presentations that her firm, "Creative License," had developed for Apple Computer and others (including a dynamite system for ABC's

continued on page 408

Thunder! The Writers Assistant

Reviewed by Howard Berenbon

If you're new to the world of the Apple Macintosh, or an experienced user, you may be interested in an easy to use spelling checker called Thunder! The Writers Assistant. It has a 50,000 word dictionary, and works with most word processors, databases, and spreadsheets. It also has an abbreviation expander and corrector, and a document analyzer to give a word count, average sentence length, and more. The program is inexpensive at $49.95, and is available from the Batteries Included Division of Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. Phone: (415) 578-0316.

Installation And Use

My very first impression of the product was the name: it reminded me of a Borland International product called Lightning: a spelling checker and thesaurus program for the IBM PC, which most likely inspired the people at Batteries Included to develop Thunder. It's funny though, Borland International doesn't have a Macintosh version of Lightning and Batteries Included doesn't have an IBM PC version of Thunder.

The manual, with a color graphics picture of a black storm cloud, is seventy-three pages of easy-to-follow instructions with several samples of the display, and it starts right out with a tutorial. The program is supplied on one single-sided 3½" diskette and requires a Macintosh with at least 512K of RAM to run. And the disk is not copy protected.

No real installation is required. Thunder is already installed on the program disk, which has its own System and Finder files. All you have to do is make a backup copy and run Thunder from your backup. And it works with one or two drives, or a hard disk.

Macintosh users with only one disk drive must copy four files and the System folder to a formatted work disk. This includes the main dictionary, the supplementary dictionary, the learned words expander dictionary, and the font and desk accessory installer. Fortunately, (or unfortunately, depending on your financial position), most Macintosh owners have a second disk drive. I started with a single disk drive Macintosh Plus, and one week later added a second drive. I was tired of swapping my system disk with my application disk to get the application running (I counted five swaps to run a text editor by then, I knew I needed a second drive, but the salesman never told me I would).

An installed version of Thunder is already in the System folder, so you should copy the folder to your work disk if you don't want to reinstall Thunder. Next, copy your favorite word processor program to the disk, and your work disk is complete.

With a two disk system, or a hard disk, with Thunder in drive 1, it may be installed into your System file on any startup disk in drive 2, or on your hard disk. The Font/DA Mover is used to install Thunder as a desk accessory item in the Apple menu. And finally, all that is left to do is to copy the dictionary files to your startup disk, or your hard disk.

Opening Thunder

Using Thunder is easy: all you do is

continued on page 258

Sky Travel—Keeping Track Of The Heavens

Reviewed by Philip Chien

Keeping track of the stars, planets, and other natural objects in the night skies has been a popular pastime, and important activity for astronomers, farmers, and anybody else who has an interest in the night sky. Ancient astronomers were often sentenced to death if they failed to properly predict an eclipse or comet. Those astronomers would have had a much easier job if they had a computer to keep track of everything, or a program which could predict the locations of the stars, planets, and other major objects.

Sky Travel, by MicoIllusions, would have been a godsend for those ancient astronomers, and an excellent tool for the modern day professional astronomer, amateur, and just about anybody interested in astronomy. The program is available in versions for the Apple II, Commodore 64, and Macintosh. There are minor differences between the different versions, with the Macintosh version having the most capabilities. This review is primarily based on the Macintosh copy.

The Macintosh version of Sky Travel comes on a copyable 400K diskette. To fit the entire program on a bootable diskette an early version of System and MiniFinder is used instead of Finder. It may cause problems if you try to boot the diskette on a Macintosh II, however, it's quite easy to copy the program onto a 800K diskette with the latest versions of System and Finder. To make an 800K copy all you have to do is copy the folders on the SkyTravel diskette on to a formatted 800K diskette with a standard System Folder with whatever desk accessories or other drivers you want. Copying the program to a hard drive is just as simple.

The Sky Travel program accurately shows the sky from anywhere on Earth from 9999 BC to 9999 AD. There are two important limitations though, calendar and astronomical knowledge. Dozens of different calendars have been used by astronomers and naturally they record their observations using their own particular calendars. For example if you want to know what the sky looked like when George Washington was born, you have to remember to adjust his date for the Julian calendar then in use, as opposed to the Gregorian calendar used today. The calendar problem is relatively easy to solve by using a system of counting days from an arbitrary point—the Julian day system. The Julian system (no relation to the Julian calendar) counts days from Noon GMT on January 1, 4713 BC as the "first day," with negative numbers used to calculate backwards in time. It's relatively easy to convert from Julian days into the standard Gregorian calendar used today, and the program automatically performs these calculations for you. The more important problem is that knowledge about the sky isn't complete. How fast does the Earth slow down? What are the formulas for the orbits of Neptune and Pluto? Within this century the program is extremely accurate, outside of this century calculations aren't as accurate.

To setup the program you should first choose the world map function to setup your location. Since the sky looks different from different locations this is extremely important to setup properly. Fortunately even if you don't know your latitude and longitude the program will help you. Just use the mouse to point your location on a map of the world. (Of course, if you can't find your location on a world map—well, in that case you probably can't find any constellations in the sky either, and probably won't find the program too useful anyway.) A set of arrow keys on the bottom of the world map screen can be used to aim your location more precisely, however for most people the additional accuracy isn't necessary. The Time Zone indicator automatically sets itself up, however it isn't always accurate. Local Time zones are fairly arbitrary and move to accommodate local communities, state lines, and other human conventions. The state of Alaska used to have four separate time zones, however they recently decided to change the entire state to one time zone to save money. The result is that when it's 10 AM (sun time) in eastern areas of Alaska it's 6 AM (sun time) in the Aleutian Islands—even though watches in both areas read the same! The time zone indicator shows you how many hours you are away from GMT, and you should adjust it properly. The manual forgets to mention Daylight Savings Time though, and you should add an extra hour if necessary.

Once you setup your location and time zone the program will show what the sky looks like from your location., The display, shown in Diagram #1 includes four windows: Sky, Clock, Info, and Position. The Sky window shows what the sky looks like. The Clock window either shows the current time, or whatever time you have the program set for. The Info window informs you whether or not an eclipse is in progress and if so whether or not it's a solar or lunar eclipse, where you are looking, and the angle of view. This window also shows information on any object included in the program's database. Finally, the position window includes your location on Earth, the Elevation and Azimuth (where you're looking in the sky), and the Right Ascension and Declination (what you're looking at in the sky). The windows are well arranged and the data's easy to interpret, especially if you ignore anything which looks too complicated. All of the windows are fixed in size, but if you have a large screen or Multi-finder you can move the windows around.

The Apple menu includes information about the program and whatever desk accessories you have on your program disk. For the distribution disk this includes only the Alarm Clock and an early version of Chooser.

The files menu includes three choices: Save MacPaint, Print Chart, and Quit. The Save and Print commands produce

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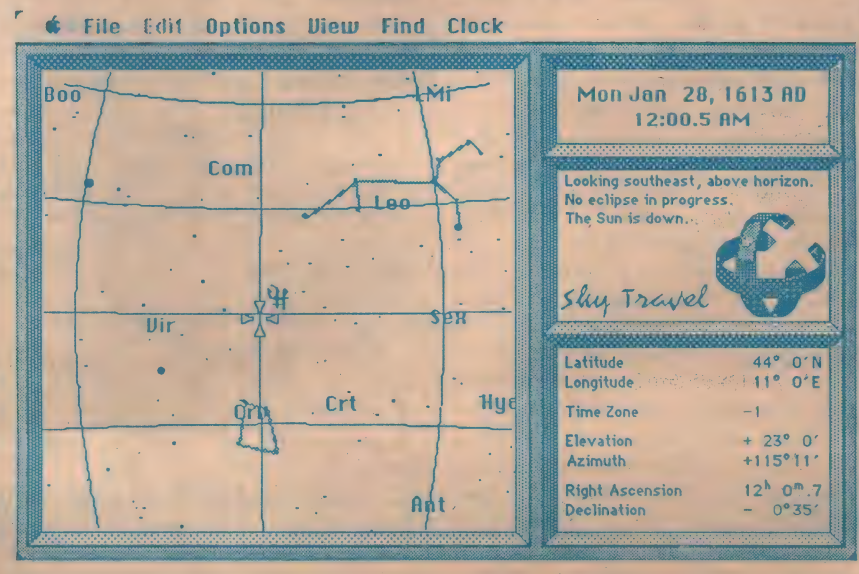

Diagram 1—Four Windows, Sky, Clock, Info & Position.

Thunder!

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select Thunder from the menu. Once done, it loads the dictionaries and it's there waiting for you to use it right from your word processor, text editor, or most programs that require inputting of text. A check mark or diamond on the menu bar indicates activation. A check mark means that Thunder scans the dictionary as you type, while the diamond tells you that you have the option to spell check either a paragraph or the whole document at one time by first selecting either. It couldn't be easier. Personally, I prefer to find my mistakes after I've finished writing my document, which I always compose at the computer. If I have to stop and correct my spelling while I'm typing, it slows me down quite a bit. So, I prefer to check a document after I'm finished. But it is great to have both options to choose from.

Compatibility

To date, Thunder has been tested and functions properly with the following applications, but I'm sure that many other applications are compatible that have not been tested as yet: Acta 1.1; BatteryPak 1.23; Excel 1.00; Factfinder 1.1; HomeTerm 3.92; Jazz 1A; JustText 1.0i; MacDraw 1.9; MacPaint; MacTerminal 2.0; MacWrite 4.5; MacWrite 2.2; MiniWriter 1.1; MockWrite 4.3.3; More 1.00; Multiplan 1.1; Ominis3 Plus 3.22.MAC; PageMaker 1.2; Smartcom 2.2b; Word 1.05.

In Use

Although the tutorial in the manual was very helpful, I never looked at it until after I tried to check my first document. Usually, to me, a true test of ease of use of a software package is not to read the manual beyond its installation procedures. This technique is probably practiced by most users. "Who reads the manual?" I've often heard. "Only when it's necessary," has been the standard reply. So, I think that if a package can be used without referring to the manual too often, it really is easy to use.

After I booted my Macintosh from the Thunder! 1.1 disk in drive 1, with my MacWrite word processor disk in drive 2, I double-clicked the Thunder application. It then installed itself as a desk accessory. Okay so far. Then I accessed Thunder, and it activated, placing a check mark in the upper right hand corner of the menu bar. Next, I started MacWrite and then proceeded to type away. But Thunder didn't seem to be working. I then took a closer look at the display, and found that the check mark was missing from the menu bar. I said to myself, "What?" and then accessed the Thunder desk accessory again. The check mark reappeared. I was relieved.

Okay, I was ready to type away again. I started typing my first sentence and deliberately misspelled "their" as "thare" but it still didn't seem to work. All I noticed was that the menu bar flashed as I typed a space. Well, it was time to read the manual. The program failed it's first test, or was it me?

Two minutes later, after reading through the beginning of the tutorial, I found that it really was working. The menu bar was supposed to blink (or ring a bell—if activated) after typing an incorrectly spelled word followed by a space. I continued typing a few more words, with two more misspellings. The tutorial said I needed to open the suggestions window to correct the words. One way to do that was to press <command> and <space bar> to open the suggestions window. This window displayed my errors with suggested corrections. If you want to check a paragraph, or a whole document, you just highlight your text using the mouse, then type <command> and <\> and it does the job, fast. The manual stated that Thunder can check text at 100

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Thunder!
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words per second, and I believe it. Later, I checked a three page document, and it was true.

Interactive checking (spell checking while typing) may be disabled by entering <command> and </> and a diamond is placed in place of the check mark at the menu bar. Now you can check a paragraph, after highlighting it with the mouse, by pressing <command> and <\>. Although I found that I could check any highlighted section no matter what was displayed on the menu bar, check mark or diamond.

Adding Words

Since the 50,000 word dictionary is fairly small, Thunder will blink at some of your words that you know are correct, but are not in the dictionary. So, you will be adding words to the dictionaries. The main dictionary only allows approximately 2000 additional words to be added, and once added they cannot be deleted. Fortunately, you can create supplementary and learned word dictionaries holding up to 32K of memory—or about 5000 to 6000 words for each file. And it's easy to add words to the supplementary dictionaries as you use Thunder. One way is through the suggestions window. Eventually, you will have have recorded most of the words you often use that it doesn't know. Once it finds a word that you know is correct, you can tell it to add the word to either your main or supplementary dictionary.

The Learned Words feature of the spelling checker is used to automatically change or correct words and to expand abbreviations and acronyms to full phrases or words. This feature, for example, can automatically correct common misspellings such as the misspelling of "receive" as "recieve." Once entered, Thunder will correct "recieve" to "receive" after it is incorrectly typed followed by a space. Abbreviations may also be programmed into your Learned Words dictionary. For example, if you type "CS" you can have Thunder replace "CS" with "Computer Shopper." Or, if you type "Dec" you can have Thunder replace it with "December." And you can replace up to 255 characters for each abbreviation or acronym.

Document Statistics

One last feature of the spelling checker is the display of your document statistics. Pressing <command> and <A> displays the document statistics including the number of characters, the number of words, the approximate number of syllables, the number of words with at least 3 syllables, the percentage of words with at least 3 syllables, the number of sentences, the average number of words per sentence, the number of paragraphs, the number of Return characters, and Gunning's Fog index and Flesch's index for readability.

In Conclusion

I really liked using Thunder. First of all, it was easy to use, even if I had to take a two minute look at the tutorial. I found that it worked well and it was fast, though a dictionary twice the size would be preferred. However, the 50,000 word dictionary was adequate, and additional words may be added to the supplementary dictionary. On the other hand, I was not very impressed with the Learned Words dictionary. Although it sounds like a useful feature to have your computer automatically expand abbreviations and check for commonly misspelled words, it seems that it would take more time than it's worth just entering those words and phrases into the dictionary. To me, it's much easier just to let Thunder check for the misspellings than to enter the commonly misspelled words in advance.

Now, I do like Thunder's display of the document statistics, because for me it's important to know the approximate number of words in a manuscript, the number of sentences, the number of paragraphs, and the total number of characters. But those are the only statistics that interest me. I find no use for the approximate number of syllables, the number of words with at least 3 syllables, the percentage of words with at least 3 syllables, the average number of words per sentence, or the number of Return characters.

Thunder is easy to use, an application that I recommend, and it's inexpensive to boot. But, what I'd really like to see added is a thesaurus; as other spelling checkers have. That would make Thunder more complete. Maybe there will be a Thunder 2 in our future? ●

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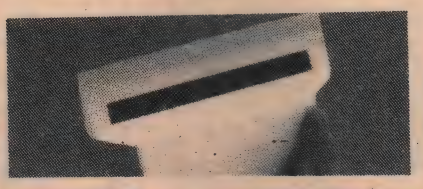

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LASERWRITER

LaserWriter Corner #19

by Don Lancaster

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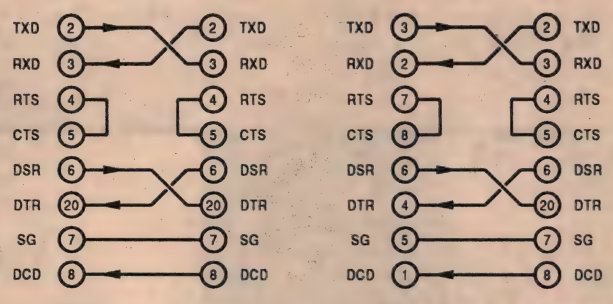
TXD 2 2 TXD
RXD 3 3 RXD
RTS 4 4 RTS
CTS 5 5 CTS
DSR 6 6 DSR
DTR 20 20 DTR
SG 7 7 SG
DCD 8 8 DCD
IBM Com1 RS232 DB25 female
Laser Writer RS232 DB25 male
TXD 3 2 TXD
RXD 2 3 RXD
RTS 7 4 RTS
CTS 8 5 CTS
DSR 6 6 DSR
DTR 4 20 DTR
SG 5 7 SG
DCD 1 8 DCD
IBM Com1 RS232 DB9 female
Laser Writer RS232 DB25 male

For quick and dirty operation, just copy your PostScript textfile to the COM-1 port. When you need return error messages or compiling routines, use *PC-Talk* or a similar comm program instead.

* * *

Be very careful how you create and use an array. If you use the stack to create or **aload** your array, you are limited to a maximum of 500 or so array values. If you create your array ahead of time and use **put** and **get**, then you are allowed as many as 65536 array values.

* * *

Here's how to activate **superexec**: First do a **1183615869 internaldict begin**. From that point on, a **{forall} superexec** or a **{get} superexec** will often override and ignore any possible **invalidaccess** errors. This greatly expands your abilities to customize PostScript code and operations.

* * *

MATERIAL OF THE MONTH —

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* * *

PUBLICATIONS OF THE MONTH —

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* * *

FREE FONT

Here's an arcjustify routine that is far faster, simpler, and much easier to kern than the pair in the blue book . . .

```
/arckern 2 def   /str ( ) def

/arcjustify {gsave /msg exch def /radius exch def translate
msg dup stringwidth pop exch length 1 sub arckern mul add 2 div
dup 57.29578 mul radius div msg {str exch 0 exch put gsave
rotate 0 radius moveto str dup dup stringwidth pop 2 div
57.29578 mul radius div neg rotate show stringwidth pop arckern
add sub dup 57.29578 mul radius div grestore} forall pop pop
grestore} def

% ---- demo. remove before use ----

/Palatino-Roman findfont [100 0 0 100 0 0] makefont
setfont 200 0 500 (FREE FONT) arcjustify   showpage
```

For upward curving text, use a *positive* radius. For downward curving text, use a *negative* radius. In either case **arckern** will set the spacing between your characters.

* * *

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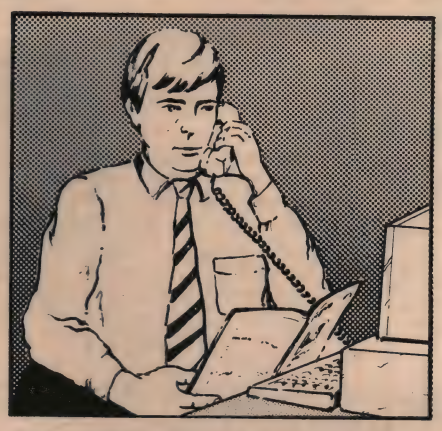

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- *Is there a service facility?*
- *Are manufacturer's warranties handled through the company?*
- *Does the seller have formal return and refund policies?*
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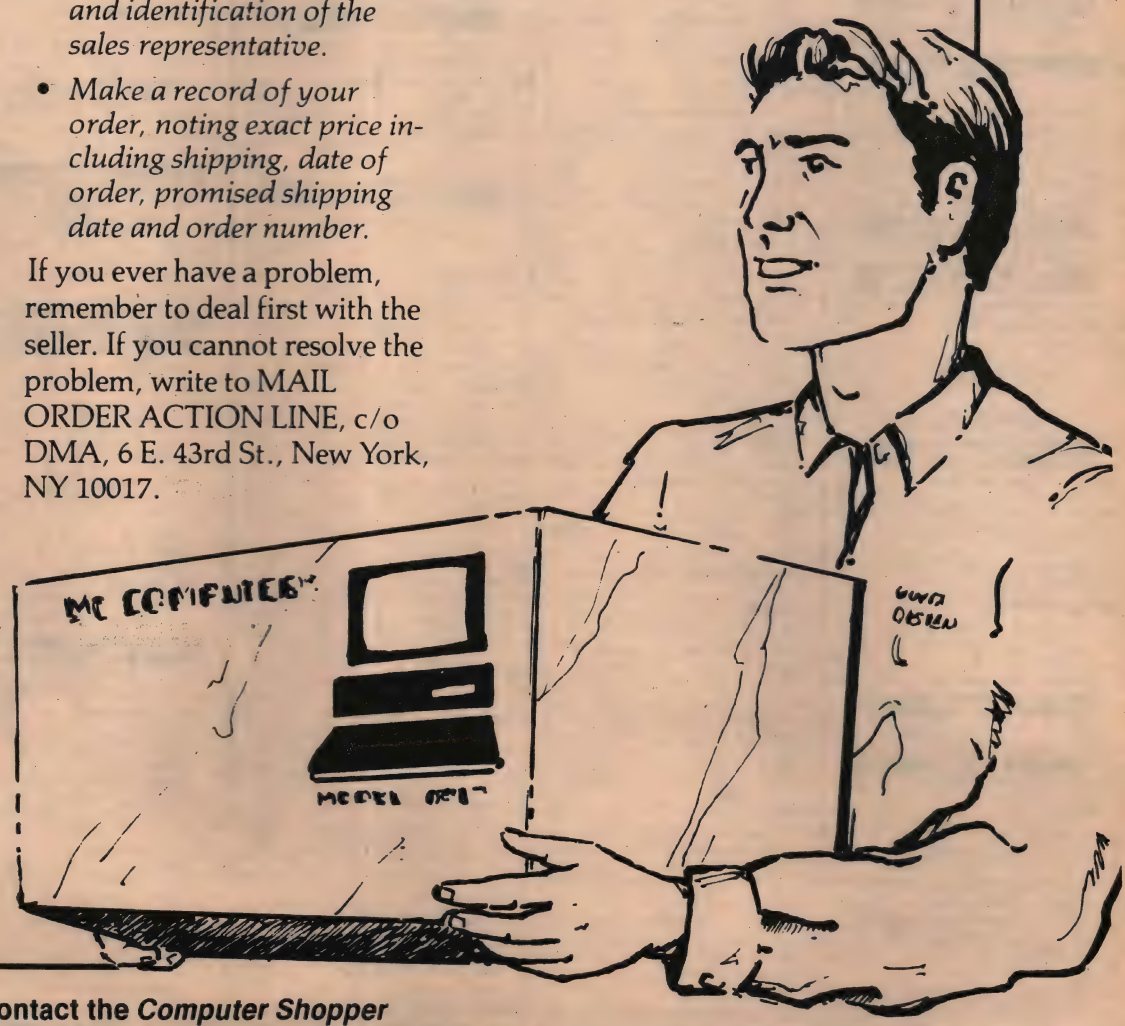

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VideoScape 3-D Version 2.0

Reviewed by George Bailey

VideoScape 3-D Version 1.0 has been out for over a year now. It was the first 3-D animation program for the Amiga, and it offered many outstanding 3-D video animation effects. The original version could produce animations in all of the Amiga's graphics modes and resolutions, except the Hold and Modify (Ham) 4,096 mode. The new Version 2.0 now supports Ham and several new surface textures, like chrome and glass. Phong dithering has also been added for more smoother surfaces.

Before we get into Version 2.0's new features, let's take a look at VideoScape and see how it can be used to create stunning, 3-D animations.

Overview Of The Original VideoScape 3-D

Creating an animation with VideoScape (VS) is a three fold process. First, is the creation of object files. These are object files made up wholly of polygons for the computer representation of three dimensional data. Secondly, you have the motion files which plot the object's movement path and angle of rotation (or no rotation at all) through the scene. And lastly, we come to the camera file. This is your eyepiece into the VideoScape world, and allows one to view an object as it moves through space. All three of these files are in ASCII, so a good working knowledge of an Amiga text editor is required. In fact, a good working knowledge of the Amiga's CLI is really needed for this program.

All three of these files are loaded into VS for compiling into an animation file.

Utilities For Creating Object Files

Since all animation files are created and stored in ASCII text, VS comes with a series of utility programs to make this task somewhat easier than plotting each point by hand. There are two, EGG for Easy Geometry Generator, and OCT for Object Composition Tool. Both are run from a CLI window. There is a third program, Aegis Designer 3-D, which is an object file editor and is an upgraded version of Colin French's Rot public domain program.

Running EGG from CLI will cause a series of prompts to appear on-screen. By answering each prompt, EGG will allow you to define graphics primitives, like spheres, cones, boxes, and an object's color, number of polygons, and object name. From here, you can also generate fractual landscapes of mountains, hills, and valleys, not to mention a checkerboard pattern ala Sculpt 3-D!

The OCT program will allow you to load in an object file to be further enhanced. For example, you can load in a sphere that you created with EGG, resize it and shrink it down to a smaller size if you wish. You can load in a variety of different objects and combine them together to create a new object altogether. You can also change the objects' colors.

The last object editor, Aegis Designer 3-D is not like EGG or OCT. It has a user interface and features a layout similar to Sculpt 3-D's; three windows each marked with X, Y, and Z for viewing the top, side, and front of an object. Each polygon must be entered by hand—no graphics primitives here! The object file can be saved as either a VS object ASCII file, or as binary "Rot" file. The Rot files can be reloaded for editing, but the VideoScape object files can't. I found Designer 3-D to be a hard program to get into. I actually found EGG to be much easier, although all three programs are severely lacking in the easy design power of Sculpt 3-D's object editor.

Object And Camera Motion

Despite all of VideoScape's utilities to generate object files, the user is left on his or her own when it comes to the creation of object motion and camera files. Fortunately, VideoScape's manual gives a lot of background on geometry and the concepts of plotting X-Y-Z coordinates. And once you finally learn to "see" in this mathematical environment, it really isn't all that hard. The user is expected to create two text files, one with a 3DM1 code for motion files and 3DC1 for camera files. A series of codes are used for determining the object's position in a given plane, and its Pitch, Yaw, and Roll. Same for the camera's position. What gets complicated here is learning the ability to "see" in this environment. What I keep yearning for here is the observor/target set up of Sculpt 3-D.

Motion and Camera files are set up for keyframing and tweening. Keyframes are the frames in the animation for directing changes in the action. Tweening is the number of frames where all of this is going to happen. Despite the added complexity of using script files, I do like the precise frame by frame control that this technique gives in an animation.

Putting It All Together

All three files are combined together in the VideoScape Control Window (see Figure 1). Here is a screen full of gadgets for assembling the respective object, motion, and camera files together. The resulting animation file can be played from here, in either wire frame or solid modeling. Many other effects, like changing the camera focal length, changing of screen resolution, and pause between frames can be controlled from here. Another thing you can do in the Control Window is load in object files only, to get a preview of how they will look. By using the number keys on the numeric keypad, the object can be shifted on all the axis, X-Y-Z, to examine the rotation and preview an animation sequence.

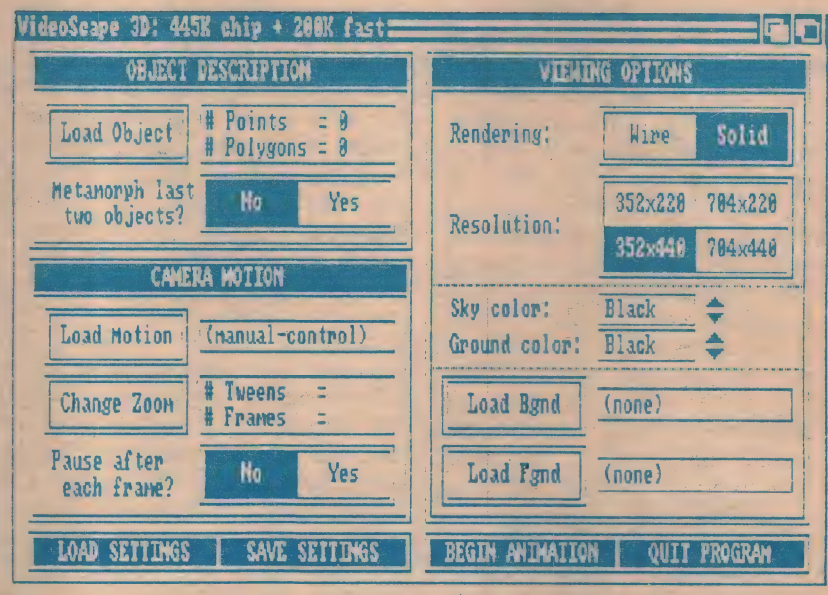

Figure 1. VideoScape 3-D control window.

After the animation file is complete, its configuration can be saved as a settings file, and then recorded to disk or VCR. Simple objects in lo-res solid modeling mode can be generated in over 5 minutes, with wire frame animations taking slightly less than that.

Think You Are Tough?

Then try out a copy of VideoScape 3-D. Amiga software can't get any

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Amigawars

by Ervin Bobo

In a very real sense, it can be said that the Amiga came out fighting. Those who remember the computer's introduction and the lean software selection of Hacker, Mindshadow, Archon and Seven Cities of Gold may dispute this—and probably will—until they recall that these games, which featured no first-person combat, were all ports from older computers.

The Amiga became a fighting machine with the introduction of combat simulators. Since such programs, in order to be worthy of your consideration and your dollars, demand the highest degree of realism—even when simulating something that does not yet exist—it is not surprising that these were also the programs that took the Amiga to it's very limits in sound and graphics.

In doing this, a war of another kind was fought and won: whatever computer you may own or dream of owning, a session with any of the four best Amiga combat simulators will quickly convince you that—in this field—there is no other computer worth considering.

The first original combat game for the Amiga—and the one to set a high mark to which all others could aspire—was Arctic Fox by Electronic Arts. Although some of the ported games had shown how good computer graphics could be, it was left to Arctic Fox to add the dimensions of sound, 3-D landscapes and furious action.

Alone in the white wilderness of Antartica, you command the tank known as Arctic Fox, a supertank of the future armed with cannon, seeing-eye missiles, land mines and capable of speeds over one hundred knots. If that last seems fantastic, it is no more so than the scenario, which has it that aliens have established a base at the South Pole, surrounded it with a force field that may be impenetrable, and are busily converting the atmosphere of earth to a poisonous gas (apparently not content to leave that endeavor to the industries of Earth).

On your side of the force field, the enemy has placed a variety of weapons, including armored sleds, tanks, fliers and the like. You'll also have to contend with rifts in the ice pack, blizzards and electrical storms.

This last was one of the most exciting features of Arctic Fox. At random intervals, the sky would darken, lightning would flash and be followed by the loud rumble of thunder; and because of what all of us, in those days, called "the power of the Amiga," these things were not done at the expense of

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PIXelations: A Review Of PIXmate

Reviewed by R. Shamms Mortier

If there's one thing that the Amiga community desires more of, it's software that goes under the appelation Utilities. Utilities begin where dedicated programs leave off, often supplementing specific packages with definitive "I-wish-this-could-do-that" options. I'm also reminded of the little bird that rides on the African rhino, or the little fish that serve the great sharks of the deep. Like them, utility packages often make the operation of ponderous software beasts much easier. Utilities always represent an expansion of the original software offering beyond the conception of the originating designer. For the Amiga, there is a wealth of such offerings, and more and more comes to market with each passing day. There are packages that enhance the capabilities of music generation software, painting programs, animation packages, and all of the other categories. There are font packages that support dedicated word processors and desktop publishing programs, "sound libraries" that allow music lovers to play a wealth of digitized instruments, and on and on—your supply is only limited by the limit of your credit card, or by your ability to hold down a second or third job.

The individual paint packages for the Amiga have set whole new standards for computer graphics. When we stop and realize what we can do today, especially those of us that have been addicted to microcomputer visuals for five years, or more, we have to stop to catch our breath. In fact, it wasn't that long ago that a modest budget could allow one to acquire all of the available programs, graphics and otherwise, that were out there in Amigaland. Now, most of us are picking and choosing. Our obsession with "owning them all" is seldom realizeable. Each Amiga painter has her/his favorites, depending upon the use to which we put the results. Just as a person primarily doing video work would not be too excited about dedicated desktop publishing fonts, so a video artist would also want certain parameters to be redressed in a graphics utility offering. PIXmate from Progressive Peripherals is to my mind and experimentation a fine tool for video work.

The first thing that always impresses or depresses me about a new piece of software is the manual. Sometimes I've been wrong, in that wonderful things have come in terrible packages, but this is usually not the case. Along with the overall design of the manual, I seek out the availability of an index, realizing that when one owns and uses more than fifty software packages, a refresher course is many times necessary between sittings. PIXmate has both a concise and clear manual and a resident index. The manual boasts tutorials (which you'll probably breeze through, since the operations are so logical), dedicated reference sections, and hints and tips (including a glossary of common terms).

Figure 1

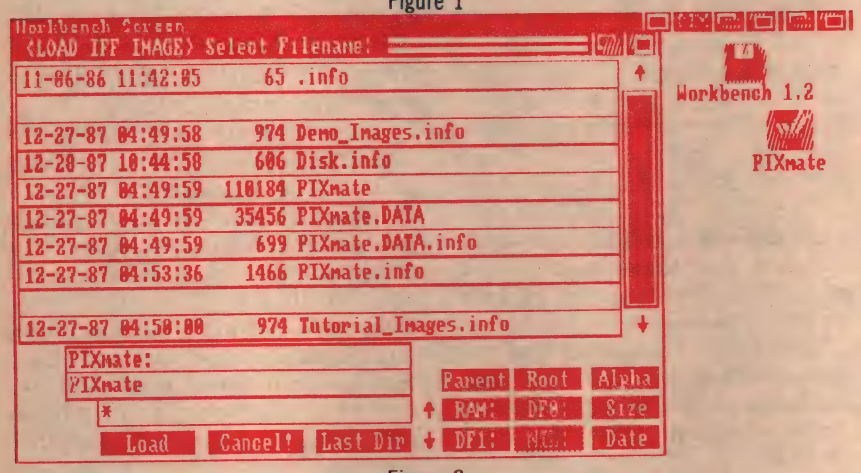

Figure 2

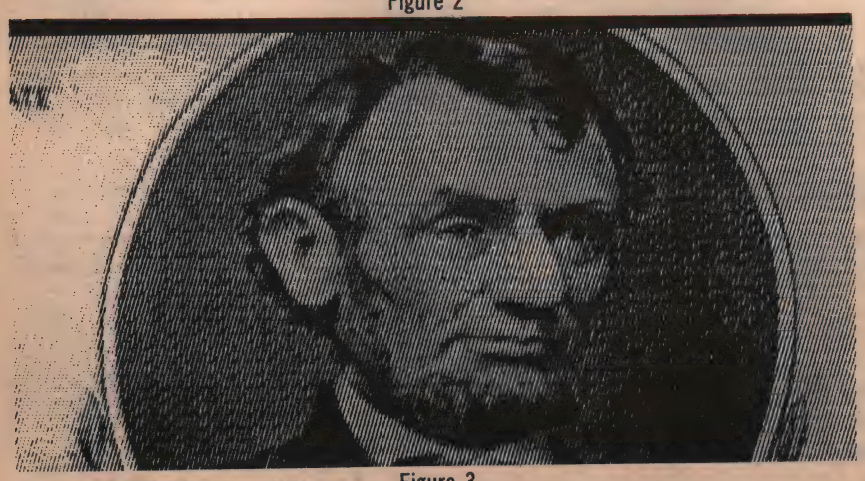

Figure 3

The image of Lincoln that accompanies this article was chosen from the tutorial section of the software. In preparing that image for publication, I enhanced it with TurboPrint for IrseeSoft in West Germany (Version 1.1, Gruntensstrabe 6, D-8951 Irsee, W. Germany. Cost: about $50.00). I am using version 1.0 of PIXmate, and an upgrade may be available by the time you read this.

Upon double clicking the left mouse button on the PIXmate icon on the Workbench screen (see Figure 1) you are presented with a wonderful introduction screen (not shown) of an astronaut on the moon with the earth rising in the background. Textual material is surrounded by marquee-like lights. When you're ready, just hit a mouse button, and—zoooom—you're spiraled into the program. The standard blank page awaits you, the menus and options and gadgets waiting for mouse awakening.

The load requester boasts a new design (see Figure 2), and is accompanied by devices that allow you to not only choose the path of your files, but to sort those files as well. You can sort the files on the disk by three available parameters: Size of the file, the Date of its creation, and by alphabetical listings. Each are useful for differing reasons. There is also little wait once you call it up again. The image of Abe that you'll see manipulated in this article is in a drawer called Tutorial Images. It is a lo-res file.

Other choices in the PROJECT list are SAVE IFF, Compress (which allows you to save disk space in your saves); READ and WRITE (which allows the experienced user to read/write IFF palette information, Read/Write raw image data by looking at the binary ASCII dump of each bitplane and storing sixteen bit words relating the RGB color settings, and finally, to reading Atari neochrome image files); DELETE (self explanatory); PREVIOUS (which loads the previous image you selected if you did); NEXT (which will load the next available image in the list); and QUIT.

The Abe Lincoln image (see Figure 3) is such a great image that I was concerned that the U.S. Treasury Service would accuse me of counterfeiting. The edit options are limited, but I imagine upgrades will offer an expanded list. There is an UNDO Buffer that can be killed (disabled till enough RAM exists to enable it again) or it can be "Disabled" (which remains in effect until you select "undo changes." Some operations require this buffer for temporary use, and have priority over the "undo" request. Video users may toggle the title bar and the pointer-sprite on and off for video taping. The screen may be cleared all at once or in part by choosing either "clear screen" or "clear area." The screen may be centered here or by hitting the "R" on the keyboard. This is sometimes annoying but necessary, as PIXmate insists on skewing the screen off to one side when any operations are performed. The screen can also be moved by using the cursor keys. This can come in quite handy for video working, because you can be recording while the screen is being moved. By holding down the "Shift" key at the same time, the screen moves in four pixel increments. You can flip to the other screen, which presents some interesting animation possibilities, especially in overscan. Parts of the image can be clipped to the other screen, either in a copying mode or by removing them from the original. You can toggle ("grab") the screen behind the current PIXmate screen, whether Workbench or another picture. There is a separate control that looks for and "grabs" DeluxePaint screens (Electronic Arts, Inc.).

Next on the Menu Bar is the "Color" menu. The options here are a lot of fun to play with. Pressing the right mouse button and holding it down after changing some of the parameters gives you a view of the entire reconfigured picture before you close the window and make your final choices. The Palette option is the first choice in the list (see Figure 4). Here you have the

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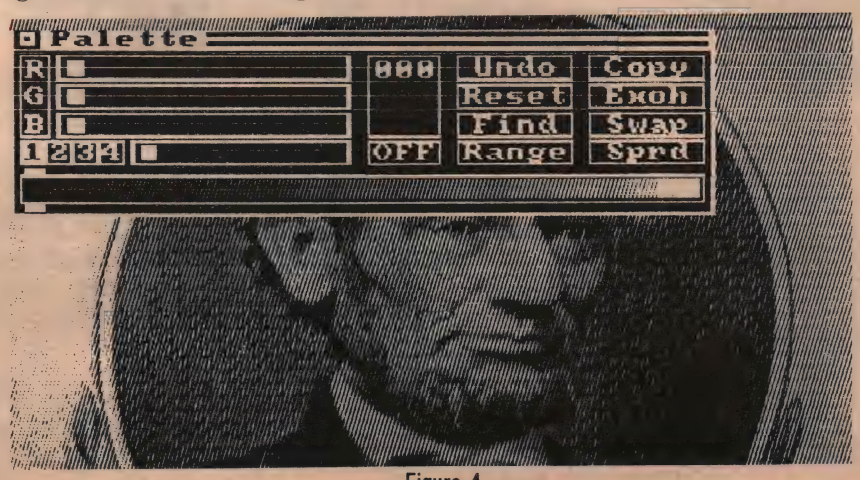

Figure 4

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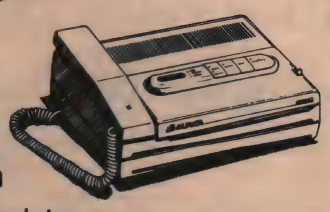

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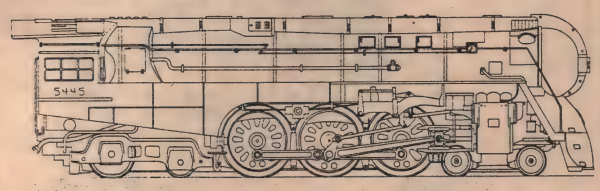

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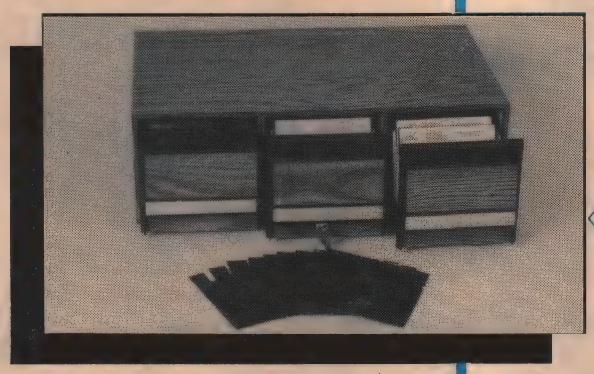

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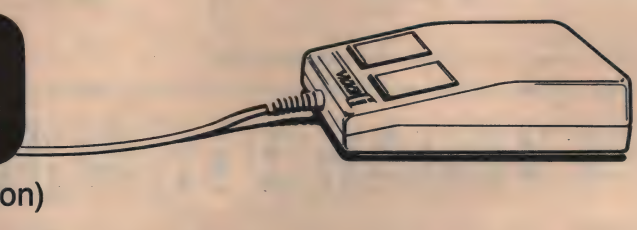

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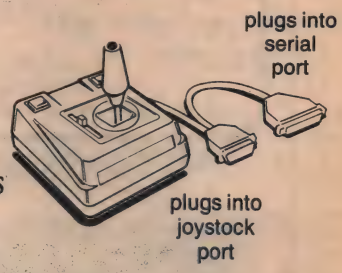

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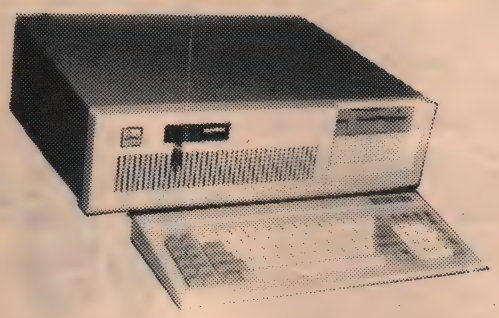

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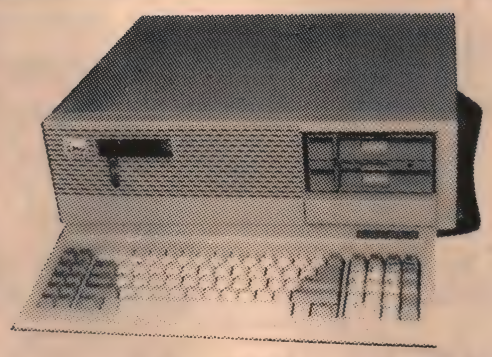

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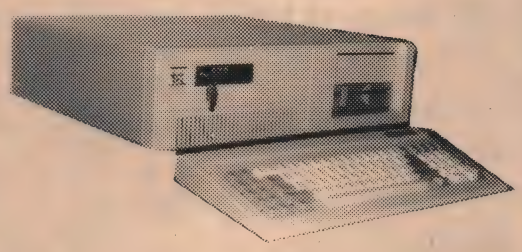

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ATARI ST

A Genius In Memory-Residence

by D.F. Scott

My computer has been Johnsonized. It is to the point now where I've become so spoiled, I'm reluctant to use anyone else's ST but my own. No one else's screen font is as clear or resolute; everyone seems to prefer the chunky, blocky system font. No one else's mouse pointer is two-colored, nor can it rotate or do back-flips while standing in place like mine can. Few other STs in my neighborhood have desk accessories selectable from one large pool when the computer is turned on, or a file selector that lets me change active drives without touching the keyboard. And whose ST can you recall that can remember your precise mouse movements and play them back for you with a keystroke, or store lists of the particular fonts you use for every publishing program you own and keep in memory only those you need?

Yes, my computer really is better than your computer; but for me to be able to make that claim, I've paid a price. The name "Charles F. Johnson" is all over my screen—in so many places that some may think the ST isn't mine but Charles'. Johnson may be the Peter Norton of the ST; but first and foremost, he is a musician and record producer in North Hollywood, California. If you've been to an Al Jarreau concert, whether in America or Australia, you've seen him on keyboard and guitar—not simultaneously, of course, but it wouldn't surprise me. Some years ago, he produced a gold album with musician George Duke called "Reach For It." Charles' own band, Catzeye, plays all over California.

The man programs STs as a venture on the side; but you'd never be able to tell that from the quality of his work. Charles has gleaned some of his knowledge of 68000 coding from some of the fellows in his neighborhood—an actual L.A. programming "gang" known as the SPUDS (Semi-Professional Users/Developers Society). Partner John Eidsvoog and Regent's Frank Cohen are also semi-members of this semi-gang. Once one of the kings of public domain and magazine-published programs, Charles now has two utility packages for sale: Antic Software's Macro Mouse; and, with John Eidsvoog, G+Plus—a complete substitute for Atari's GDOS, marketed under their new CodeHead Software label.

Freedom From GDOS Forever!

A few months ago here in *Computer Shopper*, in an article entitled "The Story So Far," we discussed the Graphic Device Operating System, a part of the GEM operating environment that was left out, for whatever reason, when GEM was ported to the ST. Different versions of GDOS have been programmed and released by Atari on disk since the ST's release in 1985—the most reliable version thus far is an older one, Version 1.1.

Once loaded on boot-up from an AUTO folder, GDOS (which, as some have pointed out, is a proper anagram of "dogs") provides the system "bindings"—standardized function calls—for handling multiple fonts for various devices of differing resolutions, and coordinating similar fonts for those devices. For instance, in order for your screen to depict—however, crudely—what will be sent to your printer, the screen must show a font of one resolution, while the printer must receive a font of the same style in a finer resolution. Both font resolutions will be accessed as separate files, in separate memory locations, by GDOS.

GDOS is also used to conduct the business of icon-drawing, using a complex structure called metafiles. Charles Johnson explains: "When you draw graphics to the screen, you're using the VDI—the Virtual Device Interface. What this does is allow you to draw a line between any two points. When you're drawing on the screen, you may want to say these two points would be x and y. What GDOS does is sit in-between those calls that draw a line from this screen point to this screen point, and actually scales it to a larger device, theoretically 32,768 by 32,768 points. A very large device, with the idea being it's better to scale down from a very large size to any smaller size—for instance, the 640 by 400 size of the monochrome screen, or the resolution of whatever printer you're using.

"The whole idea of VDI graphics is that it is able to draw to any size of device, or any resolution of any device, by specifying just the start point and the end point on this very large scheme. Then you could scale it down to the appropriate size by using very simple mathematical formulas."

So why has GDOS become the brunt of most of the complaints waged against the ST's operating system? First of all, the GDOS code is written in compiled

continued on page 443

ST Product News

by D. F. Scott

There have been several important new products entered into the ST software market, in time for the Christmas blitz. This season, quite a few of the packages adorning software store shelves will be sequels, extensions and add-ons. We preview some of them here.

Victory Through Vocabulary

In the late 1970s, those of us who were among the first to be enthusiastic about microcomputers judged the power of a BASIC language interpreter by the number of keywords it reserved. Were someone to have placed in our laps at that time MichTron GfA Basic 3.0, with 462(!) keywords, by my count, then we may very well have disavowed all allegiances with Microsoft and trashed TRS-80 Disk Basic forthwith.

I've had a chance to test GfA Basic 3 and am currently researching it further for a review in these pages soon. The new interpreter uses all of the keywords and language structure of its predecessor; although its most notable improvement is the addition of directly built-in machine-language bindings for function calls to the Virtual Device Interface and Applications Environment Services, using precisely the same syntax as a standard C compiler. Also included are special functions which directly access the TOS Line-A function calls, giving Mega users total control over the hardware blitter.

Among the new regular GfA functions are the keywords "EVERY" and "AFTER," which branch the program to a designated subroutine every set period of time or after one such period, respectively. For instance, the statement, EVERY 2000 GOSUB say_hello will branch to the "say_hello" subroutine every ten seconds (every 2000 2000ths of a second). AFTER 2000 GOSUB say_hello would merely count to 2000 once while executing the rest of the program, and then make that subroutine branch once only.

As a favor to those of us who have been missing joystick programming with GfA 2, author Frank Ostrowski (who, incidentally, also wrote Turbo BASIC for the 8-bit Atari) has implemented the old 8-bit BASIC's

continued on page 447

```
clear
username = "USERNAME~"
password = "PASSWORD~"
@trouble
    what = alert "[1][System not responding.][Continue|Abort]"
    if what=1
        goto outahere
    else
        abort
    endif
_outahere
@endsub
capture 2
  if not connect
    trouble
  endif
_top
printm "~~"
signal = wait for 30 seconds for "TERMINAL="
if signal=1
    printm "~"
else
    trouble
endif
signal = wait for 30 seconds for "@"
if signal=1
    printm "c delphi~"
else
    trouble
endif
signal = wait for 30 seconds for "Username:"
if signal=1
    printm username
else
    trouble
endif
signal = wait for 30 seconds for "Password:"
if signal=1
    printm password
else
    trouble
endif
quit
```

Listing 1: An AutoPilot Telenet/Delphi Log-On Program.

Hacking The ST

by Wynn Rostek

Well this month I'm going to talk a little about modems, and we'll cover two more files. This will take us to the halfway mark on the modem program. The two files also happen to be standalone programs that let you tailor the program to your modem, and to each of the BBSs you call.

You may wonder what all the fuss is about with configuring the program to your modem, after all, almost everyone has a Hayes compatible 1200 baud smart modem. Well there are Hayes compatible modems and then there are Hayes compatible modems.

Before the advent of cheap modem chip sets there was a tremendous variation in modem function, and there are still a lot of non-Hayes compatible modems out there.

Let's take a look at some user selectable options first, and then talk about the more exotic functions, and finally the interesting differences between modems.

When you get ready to call a BBS, there are four parameters that you usually have to set up. The first is the speed of the modem, also known as the baud rate. Years ago, home computers had 300 baud modems if they had a modem at all.

Life was simple, if you called someone you ran 300 baud because that was the only speed. Later 1200 baud modems became available to the home market. Things got a little more complicated because you had to select between 2 speeds, but that wasn't too much of a burden.

About 4 years ago the first 2400 baud modems intended for personal computers started showing up. Things got messy. We had just got around to the point that most software would switch to 300 or 1200 baud as required.

Today one of our local BBSs has 4 9600 baud modems hung on it. 9600 baud is not only possible on voice grade lines, but it is actually becoming affordable. Life has become very interesting, and a lot more complicated.

continued on page 451

Listing 1 – config.c

```
#include (stdio.h)
#include (osbind.h)
#include "ssb.h"
#include "xesup.h"

/* our local routines */
void setbaud();
void setbits();
void setdly();
void setbsy();
void setparity();
void setsmart();
void setdial();
void getistr();
void getdstr();

/* some globals */
char baud;
char bits;
char parity;
char smart;
char multi;
char dflag;
char bflag;
char dial;
char istr[20];
char dstr[20];

main()

/* this program builds a configuration file for sideband */

{
int fhand;
char buf[51];
long num;
int x;

/* clear buffers */
for (x = 0;x ( 20;x++)
    {
    istr[x] = '\0';
    dstr[x] = '\0';
    }

setbaud();
setbits();
setparity();
setsmart();
setdly();
setbsy();
setdial();
getistr();
getdstr();

/* move all the info into the buffer */
buf[0] = baud;
buf[1] = bits;
buf[2] = parity;
buf[3] = smart;
buf[4] = multi;
buf[5] = 0;
buf[6] = 0;
buf[7] = 0;
buf[8] = dflag;
buf[9] = bflag;
for (x = 0;x ( 20;x++)
    {
    buf[(10 + x)] = istr[x];
    buf[(30 + x)] = dstr[x];
    }
buf[50] = dial;

fhand = (int) Fcreate("SUPPORT\\CONFIG.DAT",0);
if (fhand ( 0)
    {
    printf("Fcreate returned %d\n",fhand);
    printf("Unable to create configuration file.\n");
    printf("The disk may be full or the SUPPORT\n");
    printf("folder may be missing.\n");
    fflush(stdout);
    waitkey();
    exit(-1);
    }
num = Fwrite(fhand,51L,buf);
if (num != 51L)
    {
    printf("Fwrite returned %ld\n",num);
    printf("Unable to write to configuration file.\n");
    printf("The disk may be full.\n");
    fflush(stdout);
    waitkey();
    exit(-1);
    }
Fclose(fhand);
delay(100);
printf("So long.\n");
fflush(stdout);
delay(2000);
}
void setbaud()

/* this function sets the baud rate character based on operator input */
/* it also sets the multi flag based on the same input                */

{
char ans;
clear();
printf("Common modem baud rates are:\n");
printf("\n\n");
printf("1.     300 baud only\n");
printf("2.     1200 baud only\n");
printf("3.     300/1200 baud\n");
printf("4.     300/1200/2400 baud\n");
printf("\nOther baud rates that SIDEBAND can use are:\n");
printf("5.     4800 baud\n");
printf("6.     9600 baud\n");
printf("\n\n\n");
printf("Please enter the number for the default baud rate: ");
fflush(stdout);

FOREVER
    {
    ans = Bconin(2);
    if (ans == '1')
        {
        baud = '3';
        multi = FALSE;
        printf("300 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '2')
        {
        baud = '1';
        multi = FALSE;
        printf("1200 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '3')
        {
        baud = '1';
        multi = TRUE;
        printf("300/1200 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '4')
        {
        baud = '2';
        multi = TRUE;
        printf("300/1200/2400 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '5')
        {
        baud = '4';
        multi = FALSE;
        printf("4800 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '6')
        {
        baud = '9';
        multi = FALSE;
        printf("9600 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
```

continued on page 454

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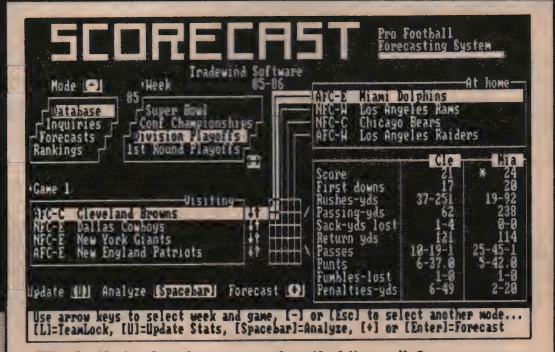

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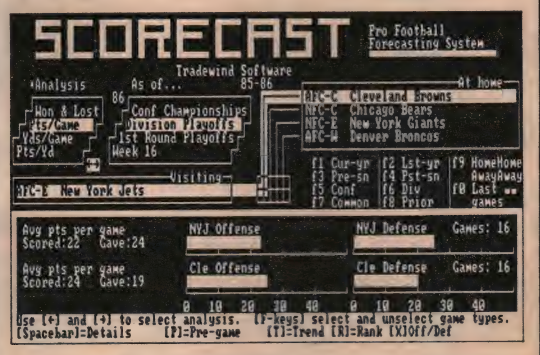

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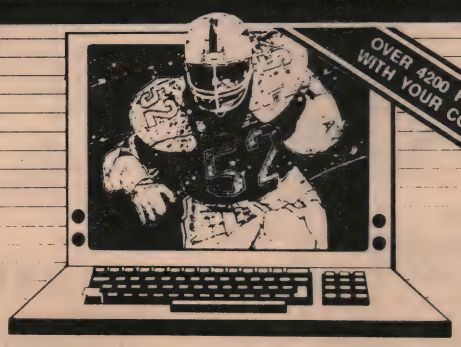

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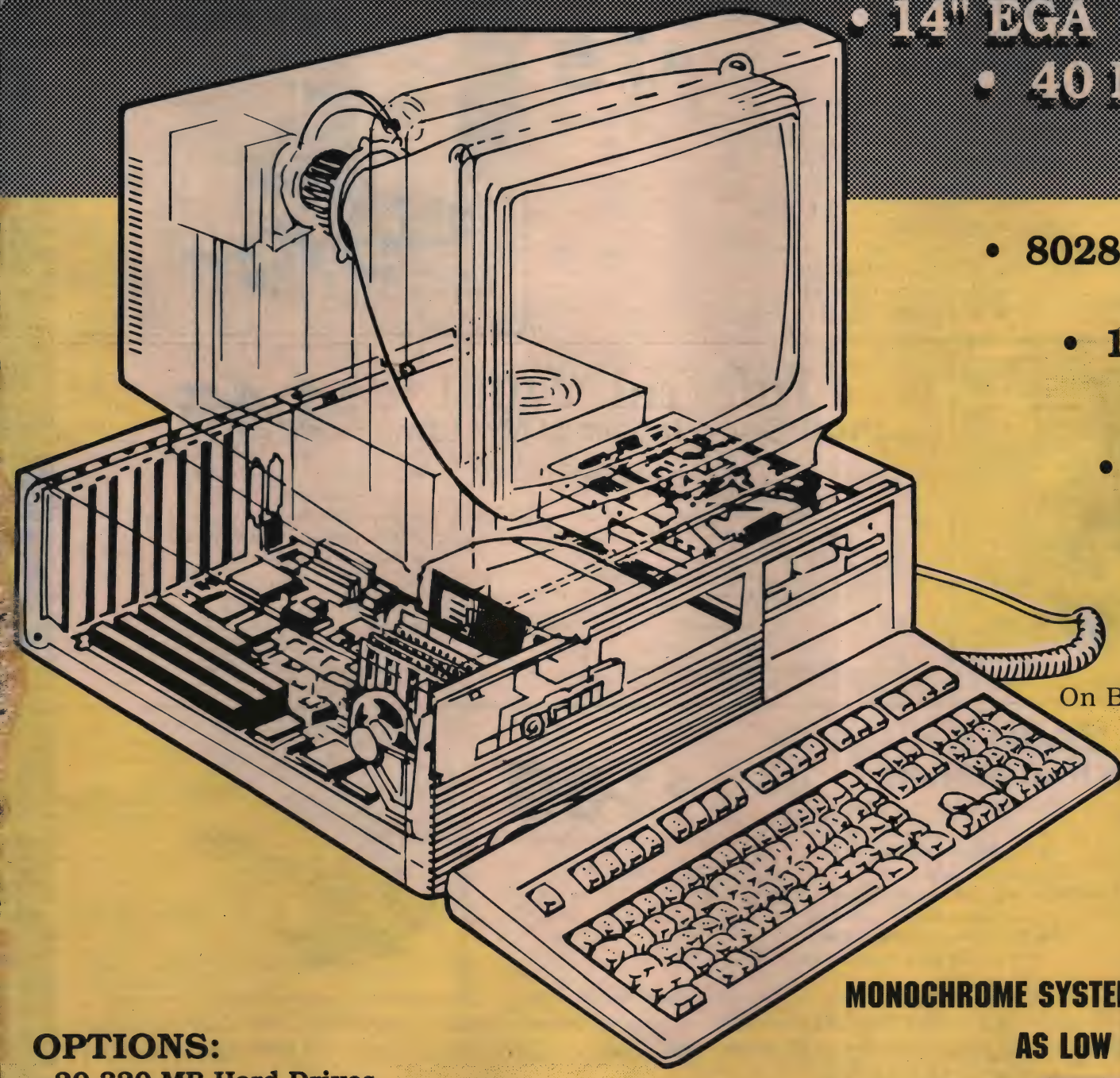

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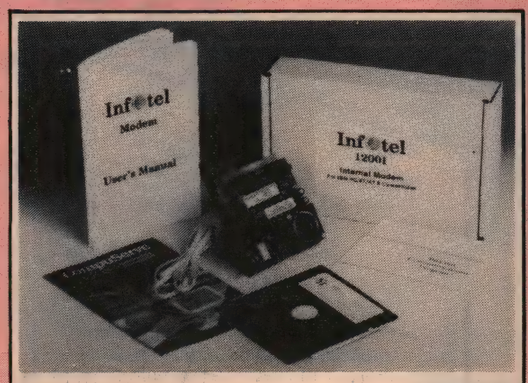

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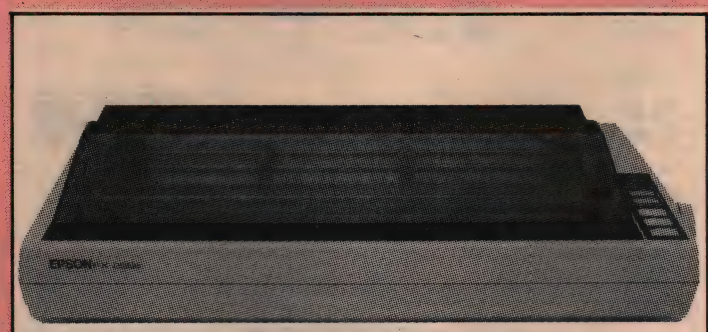

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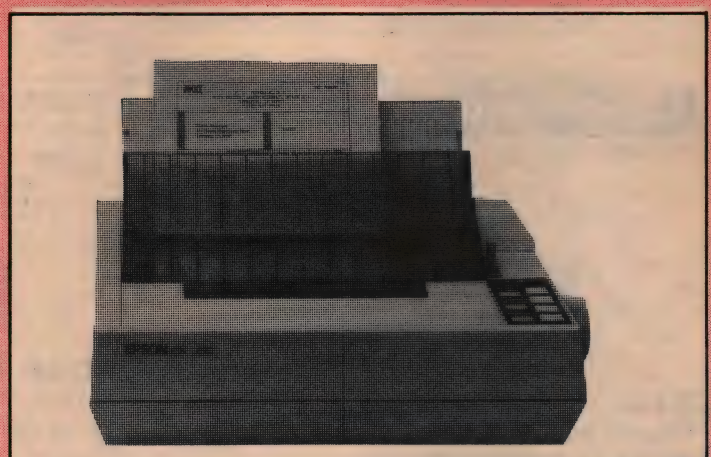

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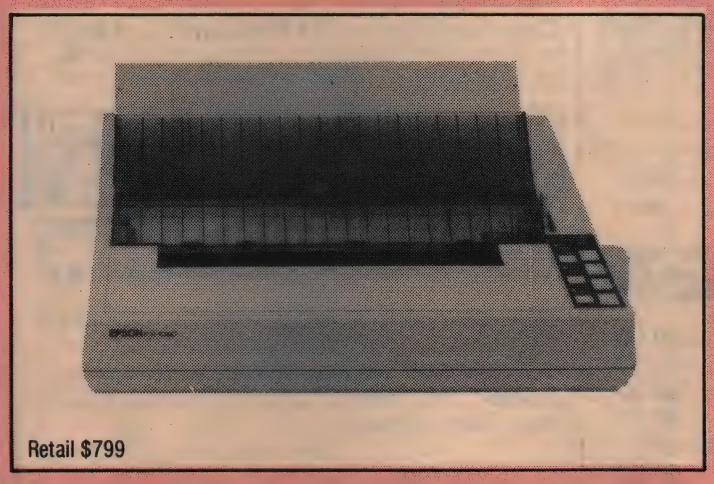

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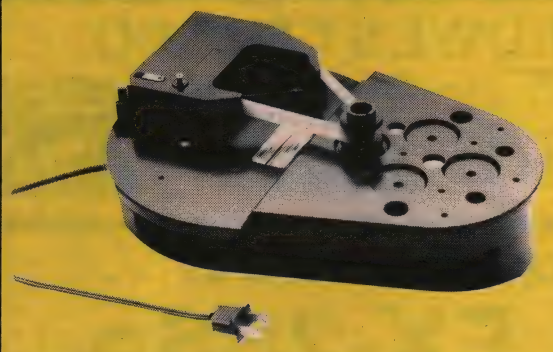

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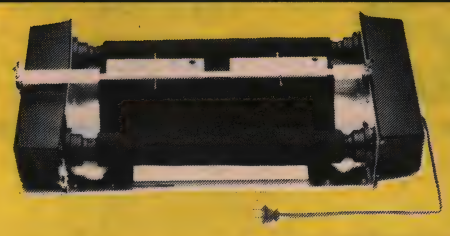

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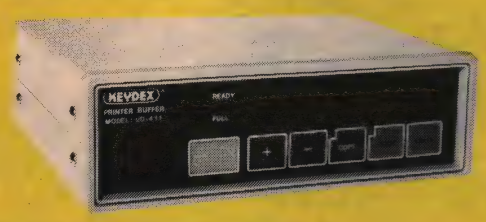

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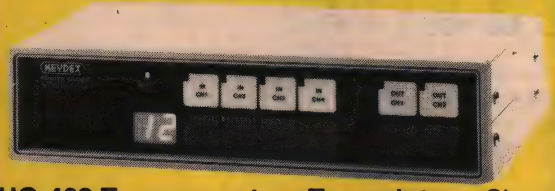

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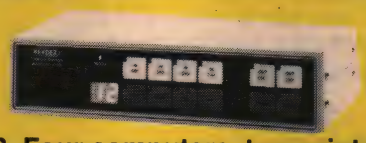

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Modems

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COMPUTER BOOKS

Computer Book List

Using Word Perfect 5
Charles O. Stewart III, et. al.
QUE
$21.95
Copyright: 1988

Right to the top of the list!! A great book, in the QUE tradition, covering the latest version of Word Perfect, *Using Word Perfect 5* leads readers from basic word processing techniques to advanced features, using a series of Quick Start tutorials. Covers the transition from WP 4.2 to WP 5.0 includes a tear out command reference. This book looks as if it's going to develop into another "QUE Classic."

The Programmers' PC Source Book
Hogan
Microsoft Press
$24.95
Pages: 560
Copyright 1988

A unique easy to use reference that integrates factual information from dozens of sources. Hundreds of charts and tables cover DOS and command utilities, memory layout, interrupts and much more. Covers IBM PCs, XT, PS/2, compatibles and all versions of PC and MSDOS to date. This is a "key" reference for technical data. DOS function calls and support tables, DOS BIOS calls, interrupts, EMS support, chips, jumpers, switches and registers, video adaptors—are all covered. The most text in this book is in the table of contents and the appendix—the rest is page after page of technical data tables.

HyperCard Developer's Guide
Danny Goodman
Bantam
$29.95
Pages: 644
Copyright: 1988

Well, from *The HyperCard Handbook*, Danny Goodman's major work here is a book for the stack designer. The "Ten Commandments about Stack Design" are taught and you will learn how to confront these challenges. Further subjects include building data arrays in HyperTalk and maximizing HyperCard's Find capabilities. If the sales of *The Handbook* are anything to judge by, this book is a sure winner. Also of interest is *HyperTalk Programming Revised Edition*, covering V1.2 from SAMS [24.95]

Working With Oracle
Hursch & Hursch
TPR (TAB)
$19.95
Copyright: 1987

This book concentrates on the daily benefits of using Oracle with its SQL query language. The full range of system applications is explained in detail, making necessary short and long term storage space projections more realistic. This is a guide for users, newcomers to Oracle/SQL as well as a good resource.

Advanced Ventura
George Sheldon
MIS: PRESS
$21.95
Copyright: 1988

A comprehensive guide for the advanced Ventura user. Covers specific hardware requirements, interfacing with commercial typesetting equipment, and integrating other software into your Ventura documents. The author, from Mount Joy, PA, has extensive experience, not only with Ventura, but Word Perfect as well. In the tradition of MIS books, this is a "mature" book for the advanced Ventura user.

UNIX: The Complete Reference
Covers System V Release 3
Stephen Coffin
Osborne/McGraw-Hill
$24.95
Pages: 750
Copyright: 1988

This addition to the *Complete Reference Series* now includes this book for UNIX users. Extensive coverage of System V, REL 3, which runs on the 386s and the new Macintosh II.

The code in the book was run on a 80386 and there is special, timely coverage of UNIX on micros. The book is similar to other *Complete Reference* works and is valuable not as a tutorial, but to be within arms reach for the command you need, when you need that one particular command and example, and you need it fast!

Mastering DAC Easy
Mosich & Chamberlain
Scott Foresman
$19.95
Pages: 442
Copyright: 1987

This book covers Version 2 and has been selling steadily to small businesses for instruction on using this very versatile and affordable accounting package. *Mastering DAC Easy* covers all DAC-Easy accounting as well as payroll modules thoroughly, provides terminology and fundamentals needed to install, operate and maintain payroll records, accounts receivable and the rest of your accounting system. A good, solid book—covering this package.

Word Perfect Release 5: The Complete Reference
Karen Acerson
Osborne/McGraw-Hill
$24.95
Copyright: 1988

This desktop resource is written especially for users of WP 5. All of its features, keys, menus, prompts and error messages are explained and in detail for both beginners and pros. Most of the details on desktop publishing are covered, including how to integrate graphics and text. Other features covered include automatic redline, strikeout and referencing. Another book to watch is *Mastering Word Perfect 5* [$21.95] from Sybex.

***MSDOS Batch File Programming* Including OS/2**
Ronny Richardson
TAB Books Inc.
$17.95
Pages: 300
Copyright: 1988

One of the few books on the subject, I was ready to sit down and save myself some time on paging through this book, and more than likely, I will. Having that inherent apprehension of DOS, I have adhered to application programming. Now, "The .BAT book" will set me free!!! The book goes straight into batch files and you should be familiar with DOS commands at the outset. Probably a useful book for both MSDOS and OS/2 users. I will recommend this one.

Using CADKey
Resatarits & Bertoline
Delmar Publishers
$35.95
Copyright: 1987

To date the only known book on the

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Cover-To-Cover Self-Publishing In A Nutshell

by Ron Albright

Some years ago, humorist Erma Bombeck wrote an article about finding a man who actually was not writing a book and had no plans to do so. The mock interview, typically hilarious, went something like "When did you first get the idea not to write a book?" The point, of course, was that writers and would be writers are everywhere.

With desktop tools, Erma would be even more hard-pressed to find someone to interview. Self-publishing has become—at least for the computer literate—the new Great American Pastime. Everyone, it has been said, has a book in them, and now they have the means to make that dream a reality.

But there are steps along the way that must be taken to ensure that your book is not just printed, but also distributed. The first assumption of this series is that you want to put together a book and sell it to the general public. You need to be aware that the fun of writing a book is all well and good, but the nuts and bolts of getting it printed, marketed and sold is just (or even more) important. The importance of the computer to these less glamorous activities will also be stressed here. This column will cover not just how to "make" a book, but how to successfully publicize and market it using your PC. Russ Marano, writing in "Hi-Tek Newsletter," remarked "Being an author is 5% writing and 95% promotion." He was right. Using the right PC tools will make you better at both.

The second assumption we need to make is that your book is going to be self-published. That means, you are going to do all the work yourself. Writing, editing, formatting, contracting a printer, advertising, distributing are all yours. If you submit and get a contract from a commercial publisher, terrific. You don't need this column. But, if you want to do it yourself, this is the place to learn how.

This column will cover the process of creating a self-published book. While we will examine the software and hardware that can make the job easy, we will also go into some of the mundane legwork that you will also have to do to make the book a success. A lot of it can be facilitated with a computer. We will cover the resources available to the author/publisher. All together, this series will be a "how-to" for those of you who want to get something—fiction or non-fiction—into a marketable form. Along the way, we will provide tips applicable to other forms of publishing—newsletters, reports, etc.—but the emphasis will be on producing a book. One final qualification. This series will concentrate on using IBM/MSDOS software and hardware. The use of the Macintosh for similar work is covered elsewhere here in *Computer Shopper*. With these intents in mind, let's get started.

Picking A Topic

While it might seem obvious (a lot of what we are going to cover may), the first important step is to choose a topic for your book. Pick one that is interesting to you and, more importantly for commercial success, one that is interesting to your readers. Make sure you have the expertise to write about it. With somewhere around 40,000 titles

continued on page 561

GFA Basic Programmers Reference Guide, Volume I

Reviewed by Frank and Sally Nagy

Programmers Unleash GFA Basic!

A GFA Programmers Bible is here! *GFA Basic Programmers Reference Guide*, Volume I offers 562 pages of information detailing GFA Basic! George W. Miller is the right man to have written this advanced programmer's reference guide.

Miller, who was once the technical editor at *COMPUTE!*, is now MichTron's Director of Technical Support and one of the leading experts on GFA Basic.

His hefty volume was undertaken in consultation with the authors of GFA Basic at GFA Systemtechnik in Germany. It's a larger work than the other GFA books in all dimensions. The book is a full 7½"x9"x1 3/16" thick!

At that, Miller still laments he didn't have enough room in the space allowed to do everything he wanted. In a telephone interview, the author told how he was forced to stop short of his goals, due to practical limitations. MichTron's printer can't bind any more than 576 pages.

What he has accomplished with this tome leaves a lot for the reader to mull over. While Miller may still be agonizing over the hole, we would like to share the donut!

Novices and experienced programmers who use the GFA Basic Interpreter won't want to be without this resource!

Though it is not within Miller's scope to teach GFA Basic to the beginner, he suggests his book can be used in conjunction with other training materials on BASIC. Descriptions of the many commands available and other useful information should prove helpful to expand the vistas of anyone growing in programming competence.

Miller begins sharing personally how he happened on GFA Basic late in 1986. He briefs us on Frank Ostrowski, GFA Basic's creator, and Ostrowski's conception to combine simplicity of language and the ability to write structured code which birthed a totally new BASIC.

Miller splashes us with major values of the language. He gets our feet wet describing similarities to and differences from other BASICs. We soon find ourselves tossed into the "deep end of the pool," swimming (dogpaddling, at least) in GFA variables, functions and structures.

This early initiation is followed by similar handling of the GFA Editor and Interpreter. Chapter 1 ends with keyboard commands after it first gets to the heart of the matter with editor commands. (This seems a little turned around to us, but that's a minor organizational difference of opinion, and certainly nothing to get bent out of shape over.)

Chapter 2 holds an encyclopedia lexicon of the GFA Basic language, Version 2.xx. This useful general reference commences with a table of contents of the language in its present form. Computer words are listed topically as they would be used in operational context. Next comes an alphabetical dictionary of commands, functions, statements, operators and variables.

His elaborate dissection of each element and inclusion of models showing them "in place" afford us both the small and large picture. He first instructs with an exploded view, then puts further perspective before us via excellent use of mini-programs. These small programs demonstrate each element's proper fit into the GFA scheme of things.

The well-rounded approach taken here and throughout the Reference Guide makes his a far better informational resource than the GFA Basic manual.

Chapter 2 continues with the Keyword Cross-Reference Section supplying an extensive, explanatory index. It illustrates proper command grammar and each command's functions and limitations (syntax and parameter). This otherwise wonderful section is marred by a minor error in page indexing, making many of the listings off by a page.

(Please note: the handy programming features of this section are duplicate in MichTron's GFA Basic Reference card. Sold separately.)

His chapter on graphics was uploaded months ago to a BBS as a teaser. We don't know about others, but that chapter worked its hook into Sally. She breathlessly waited for the rest of this book.

Miller lays out graphics simply. Several Coordinate Systems (Cartesian, Normalize Device, Polar and Raster) become clear. Demonstrations develop simple graphic screens using LINE and BOX commands from the program LINEDRAW.PRG.

Brief chronicles on various Graphics developments held our interest for his delivery of what looked like knock-out programming instructions. These several practical art lessons from simple line drawings and String Art to Fractal Art should serve up some practical methodology for the programmer.

It was interesting to discover how String Art can either be a succession of points connected by lines or a sequence of lines drawn on the screen.

Two of Miller's computer-generated art helps use principles of fractal geometry displayed in nature. Fractals seen in the rough edges of mountains, trees and clouds come to the computer artist's fingertips. Another particularly impressive demo, Kaleidoscope (KALEDIO.BAS), releases swirls of color in various permutations. These, like most shared procedures throughout the book, can easily be merged into existing programs.

For even more impressive graphics, Miller shows how to enhance arcade games with some new animation techniques. The VSYNC and SWAP commands use a form of page flipping that minimizes screen flickering. He also points out how arrays can be utilized to repeat patterns.

A GEM shape editor is featured which creates 16x16 pixel objects for storage as *.LST files or *.SHP files. Shapes created can be displayed using GET and PUT commands and moved about the screen using a joystick routine provided in the book.

This book helped Sally get a better handle on the GFA Basic commands. "I was delighted to see a control pallete where the red, blue, and green intensities were changed," she said. "I discovered new ways of setting up a color table using hexadecimal values."

No matter how impressive graphics are in a game, they are not complete without what Chapter 5 teaches about the physics of sound. Various sine and wave theories are fleshed out in the

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Mumble: The Pocket Reference

Reviewed by Richard Cheshire

Do you have a "verbal variable?" It can come in quite handy. A group I know in New York uses the word Guppy as a global variable. You know, like that singing group of the fifties, The Four Guppies. They could be talking about The Four Tops, The Four Freshmen, The Four—The list goes on, but the "verbal variable" is used to mean, "It doesn't matter, I'm speaking of them generically." When I worked in a programming shop in Massachusettes, I picked up the word "Mumble," so that you could claim that you'd just mumbled the word you wanted, but in fact, it was a "variable" where any of a number of words could fit.

Anyway, you need a "verbal variable," because Osborne McGraw-Hill has come out with a series of reference books that all have the same title, except for the name of the software the book is a reference for. Each of the books is small enough to fit in the pocket of a pair of Levi's, but too large for the pocket of imported designer jeans (I had the task of finding young women in my office wearing jeans, and checking it out for this review—What an alibi!). Of course, if you're the type to wear imported designer jeans in the first place, you probably need the other series that Osborne McGraw-Hill puts out, *Mumble: The Complete Reference*, as well as a real Hacker to read it for you.

As to what books O/McG has in the "Pocket Reference" series, run the following program (Or just look at the DATA statements):

```
10 READ MUMBLE$
20 IF MUMBLE$="END" THEN END
30 PRINT MUMBLE$;": The Pocket Reference."
40 GOTO 10
50 DATA 123,Appleworks,C,dBase III
60 DATA Displaywrite 4,DOS,OS/2,Paradox
70 DATA Quatro,Turbo Pascal,WordPerfect
80 DATA WordStar,MicroSoft Word
90 DATA Word for the Mac
100 DATA END
```

These books are not textbooks. They will not teach you how to use these languages and applications. For that, pick up *Mumble: The Complete Reference*, also published by the same folks. The "Complete Reference" books cost a pretty penny, but you get a lot of substantial book for the money, or in other words, they have a great weight to dollar ratio. Each book in the Pocket Reference series, however, is simply a reminder of what commands are, and what the switches are on the commands.

After all, there are some of us who know what we need to do, and don't want to wade through a whole thick book to find it. If you use any of the applications, you probably know there's a command that will let you do what you want, if you could remember what it was. Or another scenario—you know what the command is, but need a reminder of what the format or the syntax is to get it to work. That is what these Pocket Reference guides are good for.

No matter what the software being dealt with, each one of these reference guides has the same subtitle. In fact, you should probably add line 35 to the previous program: 35 PRINT "All the Essential Functions and Commands At Your Fingertips":PRINT. And it's true. Everything that is essential to using Mumble (whatever software you've bought the reference for) is mentioned in this book. If you can't find it in here, the software probably can't do it. More usually you can do it, but it will take a combination of commands to accomplish the job. That's the nice thing about computers, and is what true hacking is all about.

The best part is, these books are cheap. They're $5.95 or less, so I've picked up the ones I don't even need yet, like OS/2. I don't ever intend on getting into OS/2, but if, as usual, I run across someone who needs help with it, and it will be good to have around.

Again, this is not a manual, but it is "Hacker Friendly" (a different level of information set than "User Friendly"), in that the information here is probably all a good hacker needs to wander around in OS/2, and be dangerous. Someone who just bought an OS/2 based machine as their first computer and knows nothing about personal computers should be reading a more introductory book. But for those of us who wander between the machine at work, the kid's Apple at home, and helping the guy down the block, or if you just use one of these applications everyday and need an occassional reminder, these books are great. ●

Computer Book List continued from page 281

software, this book has two tutorial diskettes and is a comprehensive self-paced guide providing step by step tutorials and abundant hands-on practice for learning this CAD software. The book covers Vers 3.0 or less. Should be well worth the expense.

***Handbook Of Computer Communications*—3 Vol. Set**
Stallings
Howard Sams
Vols I, II & III—$34.95 ea.
Copyright: 1988

Vol. I—Open System Interconnection (OSI)

This volume presents a thorough treatment of the plethora of standards and protocols that have burst onto the market recently. This book deals with the OSI Standards, with chapter-length coverge on physical, data Link, Network, transport and more.

Vol. II—Local Network Standards

This volume covers the original 1985 IEEE standards, and current ISO versions of those standards. Stallings begins a survey of local area network technology that introduces key concepts and then provides a critical analysis of the alternatives.

Vol. III—DOD (Department of Defense Protocol Standards)

Military standards for computer-communication protocols that are required on all military procurement programs.

Programmer's Introduction To The Apple IIgs
Edited
Addison Wesley
$32.95
Pages: 491
Copyright: 1988

Apple IIgs programmers and enthusiasts can now have a comprehensive introduction to programming the IIgs. Details range from the new logic board and firmware to a complete description of the more than 800 powerful routines in the Apple IIgs Toolbox. This book was released in March and contains a sample diskette.

Using Sidekick Plus
Werner Feibel
Osborne/McGraw-Hill
$21.95
Pages: 429
Copyright: 1988

The success of the first Sidekick book, *Using Sidekick* was astounding. Now, with the release of Borlands' *Sidekick Plus*, here comes a book that looks well laid out and presented, and that will certainly help anyone using *Sidekick Plus* on a daily basis. The File Manager and Outline Processor are just two of the new features in the software, and they are thoroughly covered in this book. This could easily be another winner in the Borland-Osborne/McGraw-Hill series.

The ABC's Of AutoCAD—Rel 9
Alan R. Miller
Sybex
$21.95
Pages: 360
Copyright: 1988

This book, ideal for new users of AutoCAD and especially Release 9, is a step-by-step guide and assumes no prior experience with either computers or computer-aided drafting. Easy to follow tutorials are designed to help the growing number of AutoCAD users get into designing and drafting easily and quickly. Other Rel. 9 books include *Customizing AutoCAD* [$34.95] and *Mastering AutoCAD 2ED.* [$29.95]

Running R:Base for DOS
Shilepsky and Goodell
MIS: PRESS
$21.95 Book/Disk $41.95

This book is designed as a teaching tool as well as a complete reference guide to advanced features and application development techniques for users of R:Base for DOS and R:Base System V. One of the few books available at press time, covering the new R:Base for DOS software.

Mastering WordStar Release 4
Grey Harvey
Sybex
$19.95
Paper Copyright: 1987

The 125 new features and enhancements to WordStar are highlighted throughout the text and illustrated with examples and quick, step-by-step tutorials. *Mastering WordStar Release 4* is a new complete reference to using all the features in this powerful new package.

A book will be available shortly for Rel 5, *Practical Techniques In WordStar Rel 5*, By: Arca Price $19.95.

Guide To SQL: Database Management for IBM PCs and Compatibles
Baker
Scott Foresman
$22.95
Copyright: 1988 Due "Fall '88"

SQL is a flexible, highly specialized means to enhance your database; it will extend and improve the leading data management systems into new dimensions and possibilities. This book is a basic intro to SQL based on PC Oracle along with side-by-side comparison of equivalent commands in dBase.

The Communicating Computer
The Beginner, Novice, Non-Expert You Can Do It, Too!—Guide to Computer Communications
Ron Albright
Jim Horn Publications
$10.00
Pages: 100
Copyright: 1988

The book says it all. An introductory text for a novice beginning to use a modem. Chapters include: How Does It Work, Software Buying Tips, Selecting a Modem, The Commercial Networks, etc. "Modems will continue to

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ID 160 ATD2	160MB	20MS	$1659

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ID 330 MB	336MB	20MS	$2889

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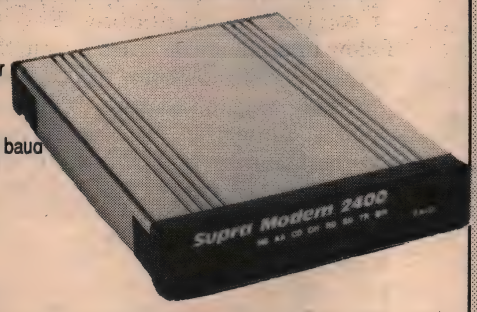

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Compaticard II $125

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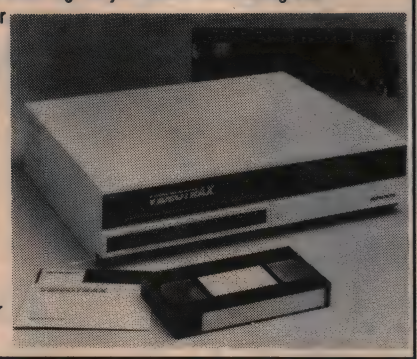

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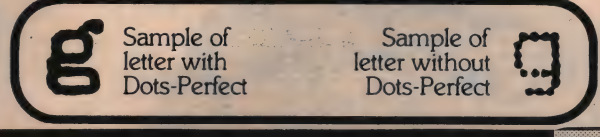

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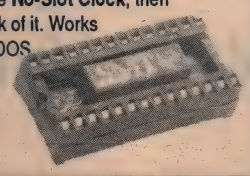

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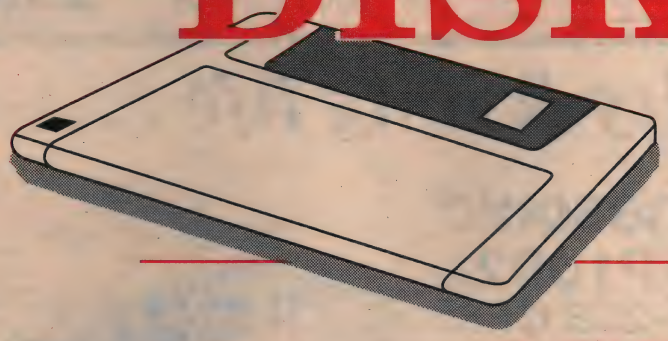

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- Fast 288 CPS Draft/48 CPS NLQ
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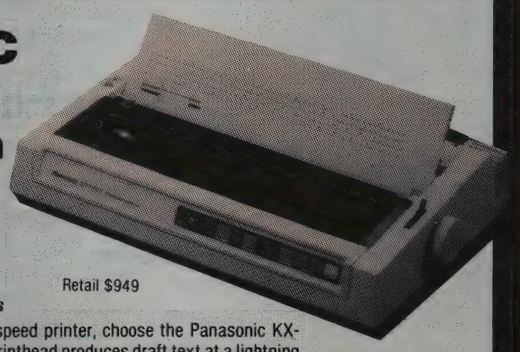

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geoSynch: Letters, News, And Hard Drives

by D. Roderick Eamon

This month we cover letters. To answer as many as possible, I edited where necessary.

Text Transfer Trauma!

First, a letter from Robert Savage, Jr. of Corpus Christie:

Dear Mr. Eamon:

I used GEOS 128 and geoWrite Workshop 128 on a 1541/1571 drive setup. It works great and I've abandoned the other word processors. However, I have over 200 files from Mirage Concepts' Word Processor Professional that I can't convert using Workshop's Text Grabber. Generic II works, except the lowercase letters become capitals, and uppercase letters vanish! Generic I ignores carriage return and line feeds. The other form files (PaperClip and WordWriter 128) fare no better with Mirage files.

Is there a clean way to convert Mirage Word Processor files to geoWrite?

Berkeley has courteously answered my query, but told me they have no plans to develop a Mirage form file. I would appreciate any help you could provide to solve this problem.

A. Robert, I discovered the same problem converting EasyScript files. If you are any good at programming, you can create a form file yourself with geoWrite 1.3 or earlier. The 128 Text Grabber forms can't port Mirage files, but other utilities can. Converting many C-64 word processor files can be done.

BSw seems to assume all 128 users run word processors written for the C-128, not the C-64. That's fine for most of us, but what if your WP is Mirage, or EasyScript?

Mirage, modelled after the CP/M version of Word Star (it even uses the E/S/D/X "star" cursor layout!) is a good C-64 word processor with powerful print routines and a large spell-check dictionary. Back in '84, Mirage was a good buy. Unfortunately, a tiny text edit area—4 to 5 pages per file—left much to be desired, and its 80-column simulator devours memory. Too bad; it left no room for underline and boldface command routines necessary for even minimal word processors. Another word processor crippled by designers who insisted on a borderline-stupid feature.

On the plus side, Mirage's text is saved to disk as PET-ASCII files, identical to EasyScript's. geoWrite Workshop's (the C-64 version) and geoPublish's Text Grabber supports EasyScript conversions. Unfortunately, GEOS 128's Grabber doesn't. If you add desktop publishing to your arsenal, you can convert those Mirage files.

You can get there without geoPub (though, 'Pub is one of the geoUniverse's best buys!). Here are two other ways to convert Mirage to geoWrite 128: 1.) WrongIsWrite and 2.) TransText. These shareware products are available online in QuantumLink's GEOS Arena, or from the authors at the addresses at this column's end. Send a SASE (self-addressed, stamped envelope) when writing for information to these creators—independent shareware writers operate on a shoestring and even return postage could break them! Here's how they stack up:

Both geoPub's Text Grabber and TransText convert WP text with form files. "EasyScript" and "Generic III" both work with Text Grabber, and the "PetASCII" form file converts Mirage files with TransText.

WrongIsWrite: Roundtrip Passage!

To translate to geoWrite and back again, WrongIsWrite can't be beat. Of the three transfer utilities, Text Grabber handles the most WP-to-geoWrite conversions; WrongIsWrite, handles two-way conversions; and creating custom form files and font changing are TransText's forte.

Finally, Convert 1.4 (on QLink when last I looked) converts GEOS files to Commodore Sequential files. Here, experimentation is the name of the game.

Questions, Questions

Next, a hand-written letter from (I hope this is right!) Thomas L. Zawodny, of Beavercreek, Ohio. With it came this cover note:

Dear Mr. Eamon:

You appear to be a C-64/GEOS "expert," at least in my book you are. Actually, anyone who writes a column for *Computer Shopper* should be able to make that claim.

I've enclosed a letter I sent to BSw over a month ago. I still have received no response. Perhaps you can shed some light on these questions, particularly, regarding the geoPrint cable.

Thanks for your time and for your column in *Computer Shopper*.

Here's the accompanying letter:

GEOS Is Great!!! But, I have questions...

1.) I have a non-GEOS format disk from a public domain source that contains 11 files. Some are BASIC programs, some are data, etc. I tried using this disk with GEOS without converting to GEOS format, with mixed results.

The second file on the disk is a small BASIC program which runs nicely under C-64 DOS with LOAD"PRINT DOCS," 8 and RUN commands. However, double-clicking this file's icon yields the "This file can't be opened from the deskTop" dialog box.

The "info" box revealed it as a C-64 Program, Sequential in structure, 1K byte in size, and not write-protected. The first file, with similar characteristics, executes with a double-click.

Question: What am I doing wrong? I copied the disk and converted it for use with GEOS (I use V-1.2), with the same result. Is it GEOS 1.2, my disk, or me? (The disk is in the TAXKIT from QS! Alliance.)

2.) When I originally purchased GEOS, I didn't own a printer. I have since purchased a Star NX-10. The User's manual suggests using the geoPrint Cable. The combination works great for all GEOS applications, but doesn't seem to work for non-GEOS programs. This is the only printer interface I have.

Questions: Is it possible to use this combination with non-GEOS programs from GEOS and any other programs outside of the GEOS environment?

Does the Star NX-10 (GC) printer driver address the printer as device #4?

Do devices 4 and 5 apply only to the Serial Port, or do they also apply to the User Port?

Does the geoPrint Cable only work in the GEOS environment?

Do I need to buy a different interface for the non-GEOS environment? (Since a parallel port interface would also work in the GEOS environment,

continued on page 293

TEXAS INSTRUMENTS

TI Forum

by Ron Albright and Jonathan Zittrain

Random Ramblings

Since we get so many letters from users asking for some other sources for TI reading, here are some addresses. In my opinion, the best single source for TI reading is (and has been for years), *MicroPendium* (P.O. Box 1343, Round Rock, Texas 78680; $20 for 12 monthly issues). Laura Burns and John Koloen put out 40 pages or so of the latest TI news, reviews, and (equally importantly) advertisements for the TI world. Much more than we can ever print here. The freelancers that write for it are the cream of the 99er world. If you are serious about your TI, its simple: you should read *MicroPendium*.

If you have disk system, the same advice holds for *Genial TRAVelER* (835 Green Valley Drive, Philadelphia, PA 19128; $36/year for a "flippy" disk bimonthly). If there is a TI historian/archiver, Barry Traver is he. His 6-time yearly "diskazine" contains TI Writer text files (reviews, tutorials, etc.) as well as full-blown programs and utilities for the 99/4A. The list of contributors are as long as my arm and run the gamut from writers to the penultimate TI programmers. These two publications—*MicroPendium* and *TRAVelER* are absolute musts for any TI owner.

The newest kid on the publication block is not really a new kid at all. Chris Bobitt, who has been writing about and programming for the 99/4A since he was knee-high to a gerbil, has finally decided to make his expertise available regularly. The *Asgard News* (P.O. Box 10306, Rockville, MD 20850; $6 for 4 quarterly issues) is now available. You may have heard Chris' and Asgard's name before in the column as producers of some of the best TI software around. If the *Asgard News* lives up to the software products from the same source, the TI world is in for a real treat. Jack Sughrue (author of the popular PLUS! utility software; Box 459, East Douglas, MA 01516; $10.00) reported in his much-reproduced "Impact-99" newssheet that "TId Bits" is a newsletter published by Bruce Forbes. Jack liked his issue and that is good enough for me. You may want to write for details to Bruce Forbes, Route 2, Box 412, Sumerduck, VA 22742.

Freebie

This months giveaway goes to Ray Cyr of Royal Oak, Michigan. Ray gets the following: Ron Prewitt's (6429 South Fife, Tacoma, Wa 98409) Fairware Disk of original programs; Bill Harms' Class software (6527 Hayes Ct., Chino, CA 91710; $10.00); TI-Base database (donated by Texaments, 53 Center St., Patchogue, NY 11772; $24.95 + $2.50 S&H); the XCOM Extended BASIC Compiler software (from DKM Enterprises, Box 501046, Indianapolis, IN 46250-1046; $49.95); Graphic Lister TI-Artist utility (Nameloc Software, 3971 S.E. Lincoln, Portland, OR 97214; $10.00 + $1.50 S&H); and the newsletter disk from the Central Westchester 99'ers User Group (from Art Byers, 1261 Williams Drive, Shrub Oak, NY 10588). This will be the last giveaway (see following). Thanks for all the support and interest!

Folding Up My Tent

Well, time has come. After over 7 years with the TI (that's right, I bought my first 99/4A for $329.00 in June,

continued on page 294

TIMEX/SINCLAIR

Sinclair Survival Column

by Mark L. Fendrick

In the last few articles we started looking at some of the features of the QL's built-in programming language, SuperBASIC. So far, we have examined some of the most rudimentary capabilities of inputting data (and accessing that data), and printing information to the screen. However, those capabilities by themselves cannot create a useful program. This month we hope to start you off in that direction and begin writing a program which you can use on your QL. With the information here (as well as past and future articles) you will be able to customize this program as well as program your own applications.

We ended the last column by discussing the use of the READ...DATA... RESTORE keywords available in SuperBASIC. Unfortunately, in order to use these, you have to know the data in advance, and insert that information directly into the DATA statements. However, this requires that the user (not always the programmer) actually get into the program and write into the proper position. This is not getting the most out of your programming. A program should operate smoothly without the end user being aware of the coding itself. In most cases, the user would not even know anything about programming if the software were to be sold to the general market. To this end, we need a way of entering a large amount of information in a manner which would give us a convenient way of entering and manipulating large amounts of information directly from the keyboard.

In order to accomplish this we need a way of having the program assign a unique variable to each bit of information we are interested in manipulating. Often we want to enter a large amount of information which needs to be related to other information. In SuperBASIC we achieve this through the use of the DIMension statement. We use this statement to create an array, or set of information boxes, into which we can type in the necessary information.

Arrays can hold either numeric or string data, although they are slightly different in use as we shall see in a moment. In order to use the array, we must first tell the computer to assign a certain amount of RAM storage in order to hold the data. This is how we would tell the computer to set aside enough room to hold 10 numbers which we will input by way of the keyboard at some time in the future.

DIMension A(9)

This statement tells the computer that you will be needing to enter 10 numbers (0-9), each of which will be identified by the variable A followed by an identifying number as we shall see. This also sets the initial value within these boxes to zero. They will remain that way until you change that value. Try the following program which allows you to enter values into this array.

```
10 DIMension A(9)
20 FOR F=0 to 9
30 INPUT "Enter a number ";A(F)
40 PRINT A(F)
50 NEXT F
60 PRINT
70 FOR F=0 to 9
80 PRINT "A(";F;") = ";A(F)
90 NEXT F
```

As you can see, we started this program off by identifying the array and initializing the values within those boxes. Next, in line 20, we use a FOR/NEXT loop to cause the program to ask you to enter a number—10 times. We tell SuperBASIC to start with the variable "F" (for F) to zero and to increase it by a value—in this case the default value of 1—each time this line is encountered by the program. We proceed to the next line—line 30—which asks for a number. The variable will change from one element of the array to the next, depending of the value of "F" (A(F)). The first time the program sees this line, the value of F is zero, so the value entered becomes identified as A(0). Once that is done, the program will proceed to line 40 which instructs it to print the value which you have just entered. Line 50 instructs SuperBASIC to check the value of F. If that value falls within the specified range specified in the FOR statement (in this case 0-9). If the value is within this range, the program goes back to the FOR statement (loops), which increments the value of F and continues in the loop until the value of F equals the final specified value. Once that happens (and F = 9 in our illustration) the program continues to the next line.

The next portion of this short program shows you that what we have just discussed has actually taken place. The loop which we now encounter will tell you the name of each element of your array and the value which you have placed within that cell. This is an example of a one dimensional numeric array. The QL is capable of multi-dimensional arrays, limited only by the amount of memory available. (Multi-dimensional arrays will be taken up in an upcoming installment of this series.)

Strings may also be handled as arrays, with a slight difference in the use of the DIMension statement. As with a numeric array, you must also indicate the maximum length of the string. Again, this is so that the computer knows how much memory to reserve. The form would be:

```
DIMension NAME$(9,15)
```

In this statement, we use the same number of elements as we did on our numeric example (10), but we also indicate (by the second number within the parentheses) that the maximum length of each member of the array may be 15 characters. (Note: These characters may be either alpha—letters—or numeric, but will be treated as a string in either case.) In the case of a numeric array, the elements were all set to a value (zero) when the DIMension was declared. In a string array, each element is also established although you do not see anything since they are padded out with spaces.

Try this example program which is similar to the one we used earlier.

```
10 DIMension NAME$(9,15)
20 FOR F=0 to 9
30 INPUT "Enter a name ";NAME$(F)
40 PRINT NAME$(F)
50 NEXT F
60 PRINT
70 FOR F=0 to 9
80 PRINT "NAME$(";F;") = ";NAME$(F)
90 NEXT F
```

The same explanation as earlier holds true. When you only specify one value within the parentheses the entire string will be printed. You could specify slices

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ATARI

Applying The Atari

by Jeff Brenner

This month we'll begin with a letter from Sam Tramiel, president of Atari Corp. The letter was sent out to users groups in response to complaints read or received by the company after Neil Harris made what was interpreted to be negative comments toward 8-bit Atari computers and their supporters. Here's the letter:

To Atari User Groups and all Atari enthusiasts:

I was disappointed to read the negative letters and articles regarding comments made by Neil Harris at the West Coast Computer Faire. We at Atari feel that our computers are the clear technological leaders in their classes. The XE/XL line is superior to the Commodore 64, and the ST series beats any 286 or 8088 MSDOS machine; it also beats the touted Macintosh (68000) machines, and even surpasses the Amiga in all areas except for internal sound.

The educational, productivity and entertainment software available for the Atari machines makes for an excellent combination which yields many uses. My family knows, as we use an 800XL, an XE Game Machine and a 1040ST. Neil was only saying that the future will bring even more powerful computers which will be easier to use, and I am sure he is right. This statement is not meant to belittle today's models or users.

While I am communicating with you, let me clear up a few things and also ask for your help.

The DRAM shortage is still with us and it is inhibiting our distribution in the U.S. We hope this will get better in the 4th quarter of '88. In the meantime, we will continue to support Atari computer presence in the U.S. We will advertise this fall to keep our presence in the U.S.

I ask all of you two things: first, please do not pirate software. Talk your friends out of it also. The software community is suffering and complaining, so please police pirating so Atari software companies can thrive. The other favor I ask of you is to be the evangelists of the Atari world. Tell your friends, associates, teachers, etc., how great the XE/XL and ST are.

Let's work together to make the Atari machines a standard in the U.S.

Sam Tramiel
President, Atari Corp.
Sunnyvale, California

The very fact that Atari Corp. (and the president, no less) chose to respond to complaints voiced by Atari owners is a good sign, in light of the fact that I've been hearing from many readers who have complained about the difficulty in getting responses by mail from the company on a variety of issues. Of course, the prominent inclusion of the XE/XL models in Sam's letter is an even more hopeful sign for us 8-bitters—when was the last time you heard an Atari representative recommend that you tell your friends about the qualities of your 8-bit machine? This may be either an earnest attempt by Atari Corp. to alleviate some of the bitter feelings in the 8-bit community toward Atari as a result of the sense of Atari's abandonment of the 8-bit line, or it may be an indication that sales of the XE Game System have exceeded Atari's highest expectations and that the company wants to ensure continued XE interest and demand for its new XE game cartridges. More likely the latter, since the XE Game System is currently selling as fast as they can be made. Declining supply and increasing demand for the 130XE computer, combined with the high demand for the XE game machine, have also been steadily driving 130XE prices up for the past several months. The street price of the 130XE has climbed $20 to $30 since June.

XE Game System Cartridges

Atari plans to release a total of 19 XE game machine cartridges in 1988. Since XE Game System cartridges are fully compatible with the 65XE, they will run on the XL (expanded 600XL) or XE computers, and most, if not all, will run on a 48K Atari 800 or 400. Some of the titles released to date, or to be released shortly, include: Ace Of Aces, Barnyard Blaster, Battlezone, Commando, Crossbow, Dark Chamber, Desert Falcon, GATO, Into The Eagles Nest, Food Fight, Karateka, and Necromancer. Many 8-bit Atari owners will recognize some of these titles, since

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ADAM

The ADAM Forum

by Paul Pappas

Software Piracy—A Growing Problem

Stand by for a special announcement. ADAM owners (with rare exceptions) have been spared a plague more virulent than any virus—copy protection (an oxymoron if I ever heard one). By fooling the operating system in a variety of ways, it is possible to create a tape/disk which may be used to load a program, but cannot be copied with standard copy utilities. In other words, you can't make a back-up copy of your program. Every time you want to use the program you must use your original media. Should something happen to your original (and rest assured, it will)—POOF—good-bye program. Oh, it's easy enough to obtain a replacement. Just mix proof of purchase, damaged media, $5 plus postage, and six weeks of waiting. Nothing to it.

Due in large part to the feeding frenzy that occurred when Coleco abandoned the ADAM, the unauthorized duplication of copyrighted software is a serious problem in the ADAM community. If it does not stop soon, ADAM dealers will at best copy protect their wares, and at worst simply stop supporting ADAM. A consortium of ADAM dealers has already taken legal action against computer pirates, and research with an eye toward copy protection is taking place. Rest assured any additional cost will be passed on to the consumer (that's you and me, people).

The developers we all depend on only want their rightful due; adequate compensation for their efforts. Is that too much to ask? The answer may be more important than you think.

We now return to our regularly scheduled column, already in progress.

SwiftPRINT

As promised last month, here is a brief review of SwiftPRINT ($15) from Digital Express [PO Box 37, Oak Hill, WV 25901, (304) 465-1341]. SwiftPRINT is a integrated graphics utility which provides two central functions, graphics printing and graphics file format interchange. Please see last month's column for additional information on the other integrated graphics utilities from DE.

Like PowerPAINT, SwiftPRINT requires at minimum a 64K RAM expander. Larger RAM expanders give you a RAM drive and the ability to enter text (note that PowerPAINT does not require the larger RAM expander to enter text). SwiftPRINT can use SmartPAINT, PowerPAINT, PaintMASTER, GraphixPAINTER, BASIC HGR, and RLE graphics. In order to print graphics you need a Centronics (printer) interface and an IBM/Epson compatible dot-matrix or Okimate 20 printer.

The first thing you notice about SwiftPRINT is the menu structure. Unlike previous DE graphics utilities, SwiftPRINT is not SmartKey driven. Instead, a crude pick-a-number interface is used. The feeble explanation given in the documentation states this system is better because, "There are no function keys to press driven menus in its last five graphic utilities because such menus are confusing and harder to use (?)."

Although the central feature of SwiftPRINT is printing, PowerPAINT offers more printing options than SwiftPRINT. SwiftPRINT offers only one (roughly 4"x4") print size, compared with the variable length and width options offered by PowerPAINT. Also, SwiftPRINT's maximum picture size is 1x2 cells (screens), compared with PowerPAINT's 4x2 cell maximum.

There are a few things SwiftPRINT can do that PowerPAINT cannot. SwiftPRINT not only reads six different graphic file formats, it also stores graphic images in any of the six formats. SwiftPRINT can vertically or horizontally flip a picture and shade black and white printing. The only important difference is the ability to print in color on an Okimate 20 printer. Normally I would rave about this ability, but the small print size greatly limits its use. Another drawback is the very slow speed at which color printing occurs. It appears the print head makes many more passes per line than necessary, wasting both time and expensive color printer ribbon.

I had high hopes for SwiftPAINT, but found it limited in scope and in need of an upgrade. This program does not meet the high standards set by previous DE releases. Unless you must have color printing on an Okimate 20, I suggest you wait for version 2.0.

PC Pursuit

There are thousands of free BBSs across the country, covering almost every interest, including ADAM (just take a peek at the BBS listings in *Computer Shopper*). Making friends with fellow computer enthusiasts across the country is great fun, until the phone bill arrives. Even on pay services, which often cost less per hour than long-distance, extensive use has forced more than one computer user to sell his computer in order to pay the bill. Telecommunications may be addictive, but it need not be expensive.

Telenet's PC Pursuit Service is designed for computer users who need a cost-effective alternative to long-distance services for telecommunications. With a local call to the Telenet Public Data Network (available in nearly 18,000 cities), PC Pursuit allows computer users to access computer services in most major metropolitan areas across the country. A service is called "PC Pursuitable" if the system resides in an area served by the network.

For a flat fee of $25 per month you have unlimited access to the service from 6 pm to 7 am (local time) and all day on weekends and holidays. Daytime usage is approximately $14 per hour (so stick to nights and weekends, OK?). In order to use PC Pursuit you need a Visa or Mastercard and modem with terminal software (like the ADAM modem and ADAMLink software). For more information or to sign-up call (voice) 1-800-635-3638 between 8 am and 5 pm EDT.

Gone But Not Forgotten

Eve Electronics, an early developer of ADAM products has ceased operations. Orphanware [5665 Myers Road, Akron, OH 44319, (216) 882-4720] will repair original boards and plans to produce Eve compatible products such as the clock/calender and speech synthesis boards.

Echelon, distributor of the Z-System, a popular CP/M replacement, shutdown rather (read very) quietly a few months ago. This was a major blow to CP/M users, but not a fatal one. Joe Wright [c/o Alpha Systems, 711 Chatsworth Place, San Jose, CA 95128.

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TANDY

The CoCo Column

by Dan Robins

Tandy has released their new catalog for 1989. Although there are new offerings for the Color Computer, they're somewhat disappointing. In this month's column, we'll take a look at what we can expect for the new year and review a few of the new offerings. And we'll answer a few letters from our readers.

Tandy In 1989

Once a year, the Tandy Corporation releases its new catalog. In years gone by, there have been a few disappointments and delays, but for the most part it usually brought surprises. For the Color Computer, 1989 offers a few new titles, but nothing of a spectacular nature.

More than a half dozen new ROM-pack games will be placed on store shelves. Missing is any mention of new hardware items and only one new disk-based software program is listed. The exclusion of the Color Computer 2 from the catalog shows that Radio Shack in-

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TANDY

The CoCo Column continued from page 291

tends to aim its strategic efforts on the Color Computer 3.

Although this years offerings are slim in comparison to years past, this does not spell an end to the CoCo. It wouldn't surprise me if, within the next twelve months, Tandy offers new software which isn't in this catalog. I must admit though, the lack of any new hardware for the computer is somewhat disappointing. The only new disk-based piece of software is a game called "The Last Ninja," an arcade-type martial arts graphics that was scheduled for release in October 1988. (Catalog No. 26-3241 at $34.95)

Two ROMpack programs from the new catalog, "Castle of Tharoggad" and "TypeMate" have been released, and are reviewed later in this month's column. Other ROMpacks on the block for the new year include "Super Pitfall" (Catalog No. 26-3171 at $29.95), just like the Nintendo arcade game for the Color Computer 3. Play an armchair quarterback with "GFL Championship Football II" (Catalog No. 26-3172 at $29.95). You'll be a warrior in the year 2500 A.D. with the new ROMpack "Rad Warrior" (Catalog No. 26-3162 at $29.95), which is also exclusively for the CoCo 3.

New ROMpacks which will work with both the CoCo 1/2 and the CoCo 3 are Slipheed (Catalog No. 26-3054 at $29.95), Tetris (Catalog No. 26-3163 at $29.95), and Soko-Ban (Catalog No. 26-3161 at $29.95). You're an ace pilot out to defend the United Universe against the evil empire with Slipheed, while Tetris pits you in a game against both the Soviets and time! Soko-Ban is a 50 level strategy maze game.

On the educational front, 1989 brings two new ROMpacks. TypeMate and Math Tutor. Helpful for the first through sixth grader, Math Tutor (Catalog No. 26-3148 at $24.95) should help build skills in addition, subtraction, multiplication, fractions, decimals, and percents.

With the lack of new "power" products for the Color Computer, this may be the year for third party vendors. I have heard of and seen a few of these new products we'll hear about in the future for these vendors, and I truly don't see a stagnant period for the CoCo, but think Tandy might just miss being on the boat.

Reviews And News

Two new ROMpacks were available from Radio Shack when the new catalog was released. The "Castle Of Tharoggad" (Catalog No. 26-3159 at $29.95) is, more or less, a remake of "Dungeons of Daggorath," only it takes advantage of the Color Computer 3's high resolution graphics. If you will notice, "Tharoggad" is almost "Daggorath" spelled backwards!

It combines an adventure game with some graphics capabilities, as you attempt to save the Good Wizard who was kidnapped and imprisoned somewhere in the castle by his evil brother. The use of a joystick and icons spell the difference between this version and its predecessor.

Written by Computerware, a well respected Color Computer company, the "Castle of Tharoggad" is a good update for those who enjoyed the earlier version, and its 5 levels of play will definitely present a good challenge for those not yet familiar with the game.

If you're one of those "hunt and peck" typists, the ROMpack "TypeMate" (Catalog No. 26-3155 at $24.95) could be the answer for you. Written for use in the PMODE 4 graphics mode, I was impressed by the very professional presentation of the program that even includes windowing!

"TypeMate" gives you detailed instructions about finger positions on each letter of the keyboard in the selection "Fingers and Keys." The exercise selection offers help with left, right, or both hands, and problem fingers. The "Lessons" selection gives you the ability to create, save, load, and print a typing lesson.

If you have the desire to increase your typing skills and wish to bypass formal lessons, I would highly suggest "TypeMate" be an addition to your CoCo collection.

One of the most interesting programs I've seen from a third party vendor is one offered by softWAR Technologies called "Ironsides & Crimson Sails." The program is available directly from the company, AmeriTrust Building, 17140 Lorain Avenue, Cleveland, Ohio 44111 at the introductory rate of $8.95. The program is a steal at this price. Not only are the graphics good, but the game is too!

To begin with, you back up the diskette, and then copy the RUNB and GFX2 modules from the Basic09/Config diskette that came with the Level 2 OS9 system to the Ironsides diskette. The program must begin in a Type 7 screen (640x192—4 color graphics screen), with the STDFONTS merged into memory. softWAR includes a batch file which will perform these duties if you haven't. Some 44 different modules are loaded into the OS9 Level 2 system for use with the game. The author has merged the majority of these modules to use memory effectively.

Ironsides & Crimson Sails comes with 5 different game scenarios and requires two players, and requires keyboard response. The game is over when either you or your competitor's fleet of 10 ships are destroyed. This program is a fine example of what third party vendors can produce to take advantage of the Color Computer's graphics abilities in conjunction with the OS9 Operating System.

On the CoCo news beat, a group of folks are exploring the idea of holding a convention for OS9 users sometime in the February or March time frame, this winter. The convention, would be held in the Dallas-Fort Worth metroplex at a site to be determined. It would combine an exhibitor's show area with special attention to inexpensive booths where budding entrepreneurs can display their wares, lectures on both OS9 and OS9/68000. So far, the reactions from both the user community and from industry folks has been positive.

So, now, the search for a suitable site for the convention is beginning. Once a suitable site is selected, the dates for the convention, tentatively scheduled for a Saturday (all day) and Sunday (morning and early afternoon) will be set. From that point, the costs can be determined.

If you have an interest in attending the convention, either as a participant or as an exhibitor or lecturer, please drop a note or postcard to: Wayne Day, 6029-A Plum Street, Watauga, TX 76148 and let him know.

Letters From Readers

Q. From Brian Lipscomb of Philadelphia, Pennsylvania

I am a CoCo 3 owner. I currently use a cassette-based system, but will expand to a disk drive (or two) system in the near future. Since I take my system with me when I travel, I would like to know if there are any companies that sell a portable PC case that will accommodate the motherboard, two disk drives, and will allow room for the cartridge slot (or the second slot on a Y-cable).

A. To my knowledge, there is no third party vendor that sells such a case specifically for the Color Computer, however I know at least a half dozen CoCo owners who have made their own. You'll find quite a few vendors in the *Computer Shopper* who sell IBM-PC cases which will work just fine. The disk drives will fit fine in the slots these cases provide. The biggest challenge you face is safely anchoring the Color Computer motherboard inside the PC case. As you will notice, the screw holes don't match correctly, but some epoxy glue and a few pliable plastic blocks will take

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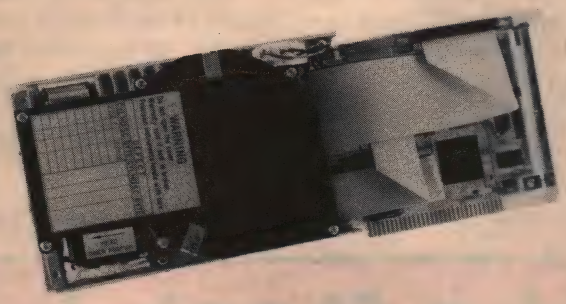

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COMMODORE

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did I make a bad interface decision?)

3.) Upgrades: How do you go about upgrading? So far, the only upgrade information I've received was in the GEOSNEWS newsletter.

Questions: How are (will) GEOS owners be contacted about upgrades—procedures, costs, etc.?

Does a GEOS application need to be a V-1.3 in order to apply to a future revision of GEOS?

Would I benefit to go to V-1.3 now? If so, how do I get it?

I'm trying to get all of my applications to fit and operate within the (GEOS) environment. Currently, my biggest problems are understanding it all and getting my printer to work in all situations.

P.S. Even though I bought GEOS over a year ago, I've only recently begun to use it in earnest. I don't have a modem, and don't really care to go online. Thanks for your time.

A. First, thanks Thomas, for the nice words about *Computer Shopper*, and my column. Me, an expert? I'm honored! I'm a user, like yourself, who saw potential in GEOS. In my opinion, GEOS extended the C-64s useful life as a productive and competitive machine. In many ways, the C-64/GEOS marriage lets 8-bit computerist perform tasks that normally take a 16 or 32 bit machine. Now, that's productivity! On to all your questions.

"This File Can't Be Opened"

How GEOS handles non-GEOS programs and disks: GEOS doesn't "run" programs designed to run under Commodore DOS—it simply loads them. If a program is smaller than 27X, diskTurbo speeds loading. Programs (applications) that "run" under GEOS must be written specifically for GEOS—or converted (a major programming job!) to GEOS.

When loading, it doesn't matter if a disk was converted or not. Some BASIC programs just won't load directly from the desktop, but will through Commodore's BASIC Interpreter. Select "BASIC" in the Options Menu, then load from the C-64 initial screen. Programs that load with the 'LOAD"*",8,1 [RETURN]' (the first program on the disk) command will load from desktop. If you use a RAM Expander (GEOS V-1.3 or greater), and the program loaded doesn't disturb the computer memory where a "RAM Reboot" routine resides, you can leap back into GEOS in seconds by hitting the RESTORE key.

"Converting" non-GEOS disk converts the disk, not files or programs on that disk. "Disk" conversion lets you move files to the border area, adds an "Info Box" file, and create a GEOS Header. This "conversion" simply eases file handling while in GEOS.

GeoPrinting

Although out of production, I want a geoPrint Cable: it delivers higher print speed than Centronics interfaces. Since all my graphics and a fair share of my word processing flows from GEOS, it makes sense. Another word processor I use—EasyScript—has a User Port setup, via an RS-232 interface. I know several programs that also do this, but these are the exception.

Yes, the GC printer driver addresses your NX-10 as device #4, though indirectly. Generally, every peripheral has its own device number. These input/output command channels can be altered via software. The RS-232-C (User Port) is accessed by opening a software channel to Device #2, as in this line from a terminal program:

OPEN3,2,0,CHR$(6) + CHR$(112)

Don't worry; the printer driver sends the NX-10 the right commands. As long as the printer is configured as device #4, you're fine! For full information on input/output operations, check out a Programmer's Reference Guide for your computer.

Was buying a geoPrint Cable a mistake? You decide: Centronics-type interfaces are far more popular but slower, and they cost more than a geoPrint Cable. Parallel port interfaces are generally easier to use. With GEOS as your main operating system, and geoWrite (I use geoWrite 2.0 or 2.1, never 1.2 or 1.3) for a word processor, you've made a wise choice.

On Becoming Upwardly Mobile

Upgrades are simple: Berkeley includes all the information in the newsletter you received, GEOS NEWS. All you need to know should be on the last page—though by now, you've probably heard about Version 2.0—in my opinion upgrade, 2.0 is the only route to take!

In a way it's too bad you have no wish to go "online." QuantumLink is not only the quickest way to get a response from BSw (usually under two days!), it's also the only way I've been able to speak directly to Commodore!

QLink costs a little money. If that's a problem, a modem can still be useful. Depending on your software, you can exchange files between friends and business associates, no matter what computer they own! Bulletin board systems (BBS) are everywhere—some are free! Since both BBSs and online services include message areas, you can also get informed answers from experienced users.

In short, Tom, without a modem you can't use your computer's full potential. A modem opens a world of public domain freeware and shareware. Even on a budget, a modem can be a good buy!

Running Hard And Fast

The last letter from Michael Rowley of Neoga, Illinois, was sent to our Editor, Stan Veit, regarding a point I raised in my part of a collaborative article. His question indirectly applies to geoUsers, so here it is:

Dear Editor:

In the June 1988 issue, in "State of the Eight: Eight Bits Alive and Running," D. Roderick Eamon mentions that hard drives are available for Commodores. I am interested in a hard drive for my 128 and would appreciate any information on these hard drives.

I would also like to tell you how much I enjoy *Computer Shopper*. Through your magazine I purchased my computer, both disk drives, and printer. I'm not yet a subscriber but I buy a copy when I find it on the newsstand.

A. What an appreciative group of letter writers! Now, let's go for that drive.

The current batch of hard disk drives for Commodore 8-bit computers are Janus-faced—one face shows speed (up to 100 times faster than a 1541) and a vast storage ability; the other face—a grim one!—the price of the technology, high compared to the same setup on a PC-clone.

Why? Well, Commodore-specific hard drives begins where the PCs stop: with a full-blown IBM compatible hard drive and controller card. Add a case, power supply, custom SCSI (Small Computer System Interface, or scuzzy) card and enhanced 200K DOS, and the greenback stack grows! The small five megabyte drive from JCT, with a claimed CP/M and GEOS compatibility and built-in floppy drive, scrapes the underbelly at a half/grand. The capacious Lt. Kernal approaches four figures. Plainly, these drives aren't cheap. Buying one under 5-megs would waste your money.

Now, a plus: These deliver the lowest cost/per/byte permanent storage anywhere, including the mythical $30 1541 garage sale buy! Let's look at the Lt. Kernal: about $950 for the C-128 version, 20 megabytes, 120 partitioned

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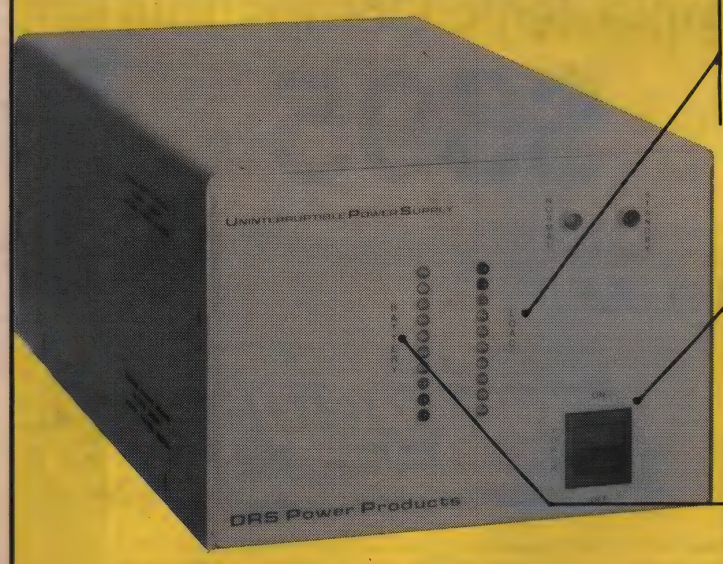
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TEXAS INSTRUMENTS

TI Forum continued from page 289

1981), the time has come for me to move over and let some new blood carry the banner. Having written about the 99er world for so long, my "word-well" has run dry. First, as a local newsletter editor, then, as a contributor to *MicroPendium* magazine and, finally, as co-contributor to this column for over 2½ years, I have decided to make this column my last. I will not elaborate on all the factors involved in my decision—that would take more than my allotted space.

Suffice it to say that I am not abandoning the TI, I have just passed it on. My kids don't allow me enough time on the console to do it justice. I admit I have a desktop IBM clone, a Radio Shack Model 100, and Toshiba 1000 laptop and use those machines' software more and more. But, let me clear up a common misconception: having and using another computer brand doesn't force one to lose one whit of dedication or gratitude to or appreciation for the TI 99/4A. I was discussing just that point the other day with someone who expressed amazement that the TI world is still so active, so long after its abandonment. I related to him (and probably bored him to death with this flash of insight) what having and using a 99/4A had done for me as a computer user in general. First, it made me appreciate what computers can do. From word processing to telecommunications, I feel quite a part of the mainstream (whatever that ephemeral status is) of computing. It was with the little 99/4A that I first found the wonders of bulletin board systems and commercial networks such as CompuServe, DELPHI, and GEnie. Second, I lost all fear for fiddling with the insides of computers. After gutting and reworking my TI consoles through everything from chip replacement to soldering and resoldering, I know that holding onto the notion of computers as mysterious and intimidating wonders is for those who still practice voodoo. While the other offices where I work waited days for the local information management techies to come install the hard disk drives of our new AT-clones, I had our drives installed and running in a single morning.

Third, I have come to realize the value of user groups, regardless of computer or application supported, to the computing enthusiast. It's a pity manufacturers have not. Finally, and perhaps most importantly, I learned what kind of people computer enthusiasts are. I am not talking about those who simply use computers. These run the gamut of people—from good to bad—just as car drivers and cuisinart owners do. I am talking about, well, the hackers. Perhaps no group of people outside a monastery have such qualities of unselfishness, generosity, and closeness with kindred spirits. The friends I have made among TI owners will continue to be so long after the last computer chip has cracked and the power is turned off. For these reasons and many more, I will always be a 99er. The TI Forum column will continue under JZ and my successor. I will read it every month with all the excitement I had when I wrote it. I wish you all well and every happiness.

JZ's Part

It is with great regret that I send along this installment of the TI Forum column—as you have just read, it is Ron's last. His seemingly boundless energy, talent, and competence will be sorely missed. Ron has been an incredible asset not only to the column, but to the TI community. It has been a pleasure to work with him, and I hope there is an opportunity to do so again.

You have probably read about extending Extended BASIC—Barry Traver recently contributed a comprehensive three-part series on the subject to the column. I am delighted to announce that Mr. Traver will continue to grace the TI Forum on a regular basis as my co-columnist.

Traver has been a leader of the TI community for years. He is a system operator on both the CompuServe and GEnie networks, and has contributed articles to *99'er Home Computer Magazine, Computer Shopper, MICROpendium, The Smart Programmer,* and *Super 99 Monthly.*

He started a company, Genial Computer, which publishes software for the 99/4A, including the *Genial TRAVelER* diskazine Ron mentioned.

Traver founded (and served for several years as the first president of) the Philadelphia Area TI Users Group, which is the fourth largest special interest group in the Philadelphia Area Computer Society. He heralded the Archiver revolution with his original Archiver format being adopted on hundreds of local TI electronic bulletin boards and all the major telecommunications networks.

Traver has a special interest in computers in education, home schooling his eleven-year-old son John Calvin. He has a B.A. in mathematics, M.A. in English, M.Div. in theology, and Th.M. in New Testament.

We hope to reflect the diversity of the TI community in future column topics. We have received a lot of mail from readers who have minimal TI-99/4A configurations but who are interested in inexpensive upgrading. In future columns you can expect to find do-it-yourself hardware projects such as various methods of adding 32K to the standard 99/4A console, as well as information of no-assembly-required stand alone module availability.

We hope to keep in touch with software companies and authors, providing reports of software-in-development in addition to reviews of existing products. We will keep you posted as new versions of software classics such as Funnelweb, Disk Manager 1000, and archiving/compression programs are released.

TI faires are happening more than ever, and we will be certain to publish the details of upcoming events as soon as we know them. The Los Angeles 99'ers have already set the date of their annual 99 Fest-West at the Lafayette Hotel in San Diego for February 18-19. And the LA users group is just one of many who have been faithfully sending us their original news and views. Please keep those letters and newsletters coming! They are extremely valuable to us, and we do appreciate them. We will be providing more details about users groups such as LA, Chicago, Washington D.C., and Philadelphia that allow involvement of members-at-a-distance.

Ron long ago offered his Tour de Boards, a look at TI bulletin boards across the country. To complement the larger listing of bulletin boards already found elsewhere in *Computer Shopper*, we plan to include tours of the most popular and interesting 99-oriented BBSs—especially those that are accessible through PC Pursuit, the flat-rate evening telecommunications network offered by Telenet.

Aside from the standard column, we are working to feature extra technical articles, both hardware and software-oriented. Tony Lewis, a past contributor to *MICROpendium*, has promised some fascinating hardware articles for the advanced 99'er, and Warren Agee (author of the FirstBase database program, written in c99) has offered to share some of his extensive c99 knowledge with us.

So this month marks both an ending and a beginning. Ron Albright moves on to other pursuits, leaving behind an incredible legacy for the 99'er (I see Ron did not even mention his Orphan Chronicles and Orphan's Survival Guide as part of his tremendous contributions). Barry Traver arrives with new talent and enthusiasm. And the TI Forum looks forward to another year as one of the foremost sources of news and views on the 99 family. ●

More Texas Instruments on page 554

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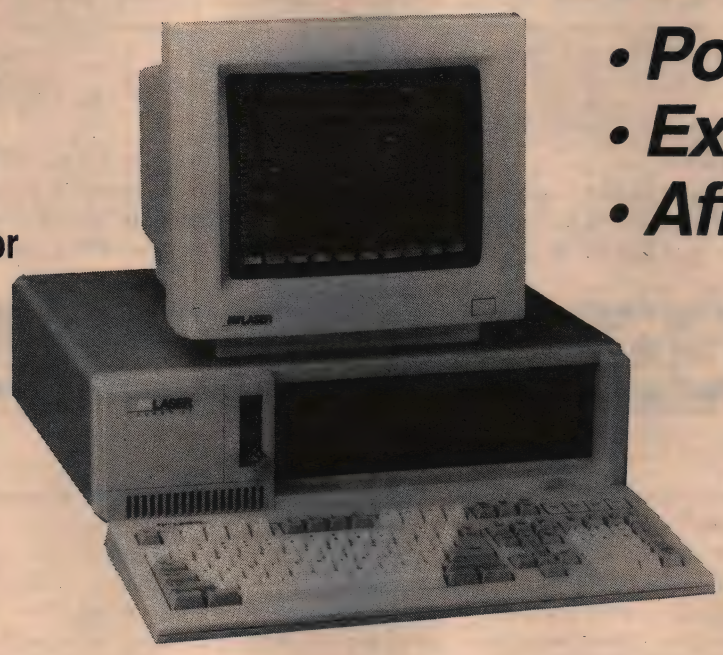

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ATARI

Applying The Atari continued from page 290

several are cartridge conversions of the original disk based games. However, the future holds even more new releases, albeit games, since Nolan Bushnell, founder of Atari Inc. (of Pong fame) has reportedly been commissioned as a software consultant to Atari Corp. to assist in the development of dozens of games.

Reader Mail

Dear Jeff:

I would like to take this opportunity to thank you for your enthusiastic review of Daisy-Dot II in the June 1988 issue of *Computer Shopper*. The response over the last few months to your article has been tremendous (I'm still getting orders from it!).

It's support like your review and the interest it generated that encourage me to continue programming for the public domain.

Roy Goldman
Denver, Colorado

Terrific! With 8-bit Atari support from third-party software developers at an all-time low, Atari owners should be grateful to see truly excellent software being unselfishly released by their authors as public domain or shareware. Incredibly, demand for new 8-bit software has been so high that many authors are finding that through donations by users or by charging a small registration fee they can generate some well-deserved profit for their efforts. I hope your letter encourages other authors to continue writing for the 8-bit Ataris despite the reluctance of software manufacturers to publish new 8-bit material, and to consider the public domain or shareware options.

Some other notable public domain releases in recent months include Alfcrunch, an amazingly efficient file compactor (although incompatible with ARC files); Signmaker, a Print Shop type program that can combine two

continued on page 298

COMMODORE

geoSynch continued from page 293

1541 drives! At slightly over $8 per "1541," storage doesn't come cheaper!

If you only use your computer for letter writing and home budgets, then a hard drive purchase would be ludicrous! However, if your computer maintains small business records and taxes, if you write for a living, are driven to run a bulletin board— or need to spend, spend, spend!—one of these drives would do just fine, thank you!

Mike, will you pay the price for massive storage? Do you really need it? You must answer these questions before signing on the dotted line.

A final mass storage note: hard drives aren't officially supported by BerkSoft. For decent mass storage that works with GEOS (with 2.0), there's the Commodore 800K, 3.50-inch 1581 drive. It's fast, compact,, intelligent, and has most of the bugs worked out. You can get 790K bytes of removable data storage for less than the cost of a 1571; a boon for memory-hungry geoPaint and geoPublish applications.

GeoNews And Notes On Upgrading To GEOS 2.0

Nice seque, wasn't it? It's late August; I've seen no GEOS 2.0 packages in computer stores, but they'll appear any second. Why am I so sure? Those who ordered upgrades received 2.0 packages. As of this writing, GEOS 2.0 (upgraded from C-64 versions 1.3 or lower, not GEOS 128 V-1.4) is in America. The upgrade price—$25.00 & $4.50 for shipping and handling; California residents must also include 7% sales tax, or $1.75—expires September 30, 1988.

Those who sent in their GEOS registration cards before May, '88 should have received the offer card in late August. All who registered after May should get their card in mid-September, very little time to take advantage to the offer! I hope BSw sees its way clear to extending this deadline.

The offer card states, "...return your GEOS Disk." Don't Do It! All registered users need send is payment and the other form (also, I'd sent the manual cover or package slipcover from your earlier version). BSw claims a two-four week delivery. If they keep to schedule, it will be a rare moment in software distribution history!

All the applications used with the previous versions can be used with GEOS 2.0. When installing your GEOS 2.0, a screen appears that says, "Have you ever installed any GEOS applications before?" Make sure to select "Yes," then put your old disk (Application side) when it asks for it.

GEOS 2.0 comes as three disks (two boot disks), an updated manual and many new features of the deskTop. This enhanced deskTop supports two disk drives: the Commodore 1541, 1571, 1581, and a 1764 or 1750 REU. The package includes geoWrite 2.1 and/or geoSpell.

New In QuantumLink's GEOS Arena!

After argument, discussion, and arbitration, a revised Convert—3.0—joins the Software Library. This program allows uploading and downloading of GEOS programs and Fonts, which BSw screened through their "shadow library" (files that have been uploaded, but not yet placed on Q-Link's download menus) "to prevent copy protected software" (pirated software, maybe?) from reaching the Libraries. In a Q-Link news release, BSw states that it hopes "...Convert 3.0 will make it easier to share files among fellow GEOS Users." Bravo!

Also new: Your chance to see the features of 2.0: a GEOS Demo is now "Live" in the Arena's Library. It's a hands-free demo of GEOS and some of its applications. Convert 3.0 renders this file to GEOS format: if you are unsure about whether or not you want to invest in 2.0, this Demo will open your eyes.

Random Glitches

GEOS 2.0—true of most major revisions, and by revision I don't mean bug fixing, I mean improvement!—is undergoing a teething period. After a quick scan of the Arena's GEOS 64 message board, I noticed several recipients of V-2.0 complained of problems. After reading a few, I realized some were the result of not reading the manual.

For example, one user carped about how one of his "disk" Icons kept disappearing on his two drive system. Well, that's because he didn't read the notice: Configure must be copied to all disks containing desktop where no RAM Expander is present. I easily duplicated the vanishing icon trick: it's user error. The manual repeats the Configure notice at least 13 times! Seems you can't relay important instructions often enough.

One user reported an occasional keyboard/mouse lockup when exiting GeoPaint. This, I couldn't duplicate. Others found irregularities in one part or another of the System. Oddly, no problem seemed to be repeated.

So far, no universal bug in 2.0 has been reported. The transiency of these problems point to quality control foul-ups. I'll watch the cries for help, and let you know what develops. As always, BSw gladly replaces defective disks.

Well, that's it for now. If you have questions or comments, send them to me, care of *Computer Shopper*, or to me at 7331 Hearthstone Way, or on QuantumLink—oh, yes!—and Delphi too, to: Geodeamon. I'll try to answer all questions.

I'd like to hear about unusual geoUses you've found for GEOS applications; I'll mention the best ones here. Also, I'd appreciate seeing newsletters produced with GEOS.

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Lt. Kernal 20 Meg. C-64 Version: $899.95; C-128 Version (supports 64/128 modes): $949.00. Xetec, 2804 Arnold Road, Salina, Kansas 67401.

JCT 5 Meg. Hard Drive: $495.00; 10 Meg, $595. JCT, P.O Box 286, Grant's Pass, Oregon 97526. Both JCT drives are reported to support 64/128 computers, CP/M, and GEOS.

WrongIsWrite: Contact (SASE) Joe Buckley, 464 Beale Street, W. Quincy, MA 02169.

TransText: Contact (SASE) Bill Sharp Computing, P.O. Box 7533, Waco, Texas 76714.

GEOS 64, 2.0: $59.95. Berkeley SoftWorks, 2150 Shattuck Avenue, Berkeley, CA 94704; (415) 644-0883.

Till next time, Ad astra! ●

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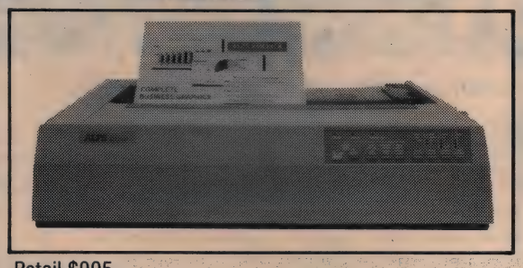

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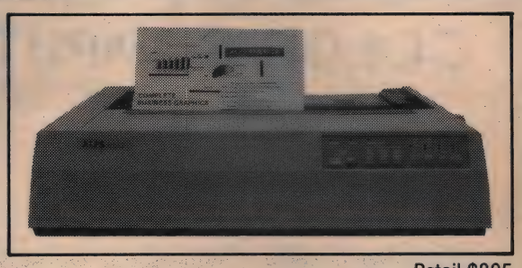

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ATARI

Applying The Atari continued from page 296

Print Shop icons and up to three Atari fonts in various sizes on a single page; and Determ, a new terminal program (versions available for the XM301/1030, 850, MPP and SX212 modems) to challenge the popular Express! program. Determ features drop down menus and a Breakout game that can be played while downloading. We'll be discussing these new programs, as well as other public domain releases in future months.

Dear Jeff:

Regarding my letter and your response in the July issue of *Computer Shopper* regarding obtaining a printer driver for AtariWriter Plus:

Enclosed is a copy of a letter that I received from Gary Furr in response to my request for a printer driver for AtariWriter Plus and a Panasonic printer. As you can see, he is not providing any support for AtariWriter Plus.

After waiting for over a month for a response from At-A-Glance (a company suggested as a possible source of the driver in the column), I have come to the conclusion that they must not have a driver for Panasonic either. It looks like my only hope is from your readers—if you have heard anything. Someone out there must have found a way to type subscripts and superscripts to a Panasonic printer without using control codes.

Dominick J. Defazio
Rochester, Michigan

I'll leave this one to the readers. If any readers have developed a driver for AtariWriter Plus that functions with your Panasonic printer, please write in and tell us.

Dear Jeff:

I am interested in learning how to interface the Atari 400 computer to outside devices. In particular, I would like to know how the Atari 400 is able to input and output information and the addressing used to control the input and output. My ultimate goal is to use the Atari for things such as timing objects using photogates, measuring temperatures using thermisters, using an A/D converter to measure voltages, and to be able to control outside devices such as robots. I have had experience doing these things on the Apple computer, but since my school district has some Atari 400 computers, I would like to be able to do the same thing with them. I would appreciate any help or direction you can give me.

Mark Pedersen
Barron, Wisconsin

The best way for you to interface your 8-bit to external devices or measuring apparatus would be through the joystick ports. The perfect article for you, which appeared in the July 1983 issue of *Byte* magazine, is "Control Your Environment With The Atari 400/800" by David Alan Hayes, and I have recommended this article to readers several times in the past. You can probably view the article at your public library. The article describes how the Atari's bidirectional joystick ports work (bidirectional meaning that they can serve as both input or output ports), and gives schematics for a hardware project and sample programs to set up the ports for input or output. If you are more interested in purchasing pre-built hardware, you may be interested in *Antic's* recent article on using the X-10 PowerHouse home controller system with an 8-bit program called PowerManager. The article, entitled "Power

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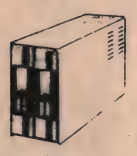

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TANDY

The CoCo Column continued from page 292

care of that problem. Drill a small hole in the middle of the plastic blocks (which will hold the screw later), and strategically glue them to the bottom of the PC case in the same pattern as the screw holes of the CoCo. Let it dry the proper amount of time, and then transfer the Color Computer's motherboard into the PC case.

Q. From Doug Jackson of Port Arthur, Texas

I saw the article in "The CoCo Column" about making the Color Computer print out PMODE graphics. I bought a program named "Print Utilities" that was supposed to print out high resolution graphics, like pictures that I had drawn with a program in the manual. The program I am using is named "Drawing Board." This program will not print out on a Tandy DMP-105 dot matrix printer. I am wondering if I could buy a graphics program that will work with the CoCo 2 and the DMP-105 printer.

A. Having the same computer and printer as you, the "Print Utilities" program should work as advertised. Never having used the "Drawing Board" program, I can't comment on it's printing ability. One way you may be able to use both, is to load (or should I say CLOADM) the "Print Utilities" program and then load and run the "Drawing Board" program. After drawing your picture, hit your BREAK key, and then follow the directions for printing as detailed in the "Print Utilities" manual. Third party vendors offer a slew of drawing programs that will work with a DMP-105 printer. These programs include CoCoMax, Graphicom, and the shareware program McPaint.

Q. From Eric Rickert of Osan Air Base, Korea

I'm currently stationed in Korea in the Air Force and items for the CoCo are non-existent. I have a CoCo 2, disk drive, modem, and an MPI. Before I return to the states, I'd like to know where my future lies in personal computing. Do you think there's any chance of a hard drive for a CoCo? Are hard drives for the PC compatible with my CoCo? I guess what I really need to know is, should I continue building up my CoCo system or invest money in a PC compatible? I like the zillions of software available for the PC, but I also like my CoCo—Do you have any comments on the CoCo and do you think it will go into a bigger system soon? If Tandy starts to offer 512K and a hard drive, I'll probably buy it.

A. Well it's nice to receive a letter with an international flavor, and you're loaded with questions! The future of the CoCo, at this moment is good. Tandy will continue carrying the Color Computer 3 during 1989, although the Color Computer 2 is no longer listed in the catalog. When it comes to investing money in a PC, you should look at the jobs you have to accomplish with it. There are certain programs that a CoCo does as fine (if not better), but then other programs are available only on a PC or compatible. You also have to take how comfortable you are with the CoCo before jumping into another brand. The Color Computer 3 is upgradable to 512K memory, and hard drives are available for the CoCo NOW! (So you better get the billfold ready. Grin.) Not all hard drives that work on a PC will work with a CoCo, but many do. Your system will need a hard disk controller and hard drive. Most hard drive setups that use an IBM-PC hard drive also require an interface. I've seen 5 meg setups for as low as $250. Will the CoCo grow into a bigger system? I'd say no, at least not for the next year, but who's to say what Tandy has buttoned up their sleeves?

As always, I invite you to send in your comments, suggestions, and questions. Send your correspondence to The CoCo Column, *Computer Shopper*, 5211 S. Washington Ave., Titusville, Florida 32780. ●

TIMEX/SINCLAIR

of that string as follows (all examples here use only the first element entered);

```
PRINT NAME$(1,to 10)      prints the first 10 characters only
PRINT NAME$(1,5 to)       prints all characters from the 5th to the end.
PRINT NAME$(1,7 to 13)    prints only the 7th through the 13th characters.
```

As we said earlier, the array may be more than the single dimension we have discussed up until this point. While the single dimension array which we have worked with so far could be thought of as a straight line with bits of data along the way, a two dimensional array would be represented as a square made up of boxes containing data.

A single dimension array, A(5), could be pictured as:

A(1) A(2) A(3) A(4) A(5)

A two dimensional array, A(7,5) could be visualized in this manner:

A(1,1)	A(2,1)	A(3,1)	A(4,1)	A(5,1)	A(6,1)	A(7,1)
A(1,2)	A(2,2)	A(3,2)	A(4,2)	A(5,2)	A(6,2)	A(7,2)
A(1,3)	A(2,3)	A(3,3)	A(4,3)	A(5,3)	A(6,3)	A(7,3)
A(1,4)	A(2,4)	A(3,4)	A(4,4)	A(5,4)	A(6,4)	A(7,4)
A(1,5)	A(2,5)	A(3,5)	A(4,5)	A(5,5)	A(6,5)	A(7,5)

If you could imagine a third (and fourth, fifth, etc.) dimension, you could utilize arrays of many levels, dependent on the amount of available RAM. String arrays may be accommodated in the same manner, keeping in mind that there must also be—as the last number in the parentheses—a definition of the length of the string.

How might you go about using this type of multi-dimensional array? Here is an example, using the A(7,5) array which we have pictured. The 7 in the definition could be imagined to be representing the seven days of the week, while the second number, 5, could be imagined to be the possible 5 weeks which a month might cover.

WEEK	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	A(1,1)	A(2,1)	A(3,1)	A(4,1)	A(5,1)	A(6,1)	A(7,1)
2	A(1,2)	A(2,2)	A(3,2)	A(4,2)	A(5,2)	A(6,2)	A(7,2)
3	A(1,3)	A(2,3)	A(3,3)	A(4,3)	A(5,3)	A(6,3)	A(7,3)
4	A(1,4)	A(2,4)	A(3,4)	A(4,4)	A(5,4)	A(6,4)	A(7,4)
5	A(1,5)	A(2,5)	A(3,5)	A(4,5)	A(5,5)	A(6,5)	A(7,5)

Now, if we assume that this is a 30 day month which starts on a Sunday, we would enter the value of 1 into A(1,1), the value of 2 into A(2,1) and so forth. The 30th (and final) day of the month would be entered into A(2,5). The remaining elements, A(3,5) through A(7,5) would be left blank.

Challenge Number One

Write a program which will allow you to set up a calendar using the multi-dimensional array which we just discussed. Make it print out to either the screen, a monitor or both at least a single month including labels to identify the month, year and day of the week. Send your program to me in care of *Computer Shopper* and I will share the most original program(s) in a future column. See your name immortalized here! Develop your programming skills and those of your fellow Sinclair enthusiasts. Be sure to describe how your program works either with separate notes, or through the use of REMark statements.

With the skills we have already learned, you now have the tools to start to create a number of useful programs which you can put to use. Starting next month, we will use these skills to start developing a name and address program which we will use to illustrate what we have already discussed, and will improve with skills which we have yet to cover.

A note to all of you who did not have the opportunity to purchase one of the original ZX-81 kits back in the days when the Sinclair computers were first making their presence felt in this country. They are once again available thanks to Zebra Systems (78-06 Jamaica Avenue; Woodhave, NY 11421; (718) 296-2385), the oldest Sinclair supporting company in the U.S. Zebra Systems has obtained a quantity of these kits (containing Spanish manuals which have been replaced by English versions) and have made them available for much less than the original $200.00 price at which they first appeared. (The Spanish language manuals are also available if you wish one.) ●

More Timex/Sinclair on page 479

ATARI

Applying The Atari continued from page 298

Manager X-10," by Charles Cherry, appeared in the August 1988 issue of *Antic* magazine. I do have a couple of other addresses in my files on companies that sold monitoring or controlling devices for the 8-bit Atari, but I have not been able to get a response from these companies and do not know if they are still in business. If any readers know of companies that presently sell monitoring or controlling devices for 8-bit Ataris, please write in and share the information.

Next Month

That's all the space we have for this month. Next month is the annual "Applying The Atari" holiday column detailing new Atari software released during the year. And this year we'll include a number of superb public domain and shareware programs that were released for the 8-bit Atari during 1988.

Questions, comments and contributions are welcome. Address all correspondence to: Jeff Brenner, "Applying The Atari, 11/88," P.O. Box F, Titusville, FL 32781. ●

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ADAM

The ADAM Forum continued from page 291

(408) 297-5594] author of several Z-System utilities, is still supporting the system. Joe has written a new version of the Z-System called NZ-COM. Unlike the Z-System, NZ-COM does not require advanced knowledge of CP/M and Z-80 programming techniques. The user simply specifies which options are desired and installation takes place automatically. Call or write for additional information.

Not quite gone is Coleco Industries, the creator of the ADAM computer. Coleco recently filed for Chapter 11 protection from creditors. This action eliminates any speculation Coleco

continued on page 300

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COMMODORE

Getting The Most From Your C-128 Trio-128

by Patrick A. Tillery

Ever need a set of programs in a small package that is easy to use, inexpensive, and covers the three main program categories? For example: a small, complete package to use when traveling, to send to college with your Commodore 128 (and son or daughter) or simply to use at home when a few of the most powerful features like a spell checker (which I couldn't do without), thesaurus, or outliner aren't needed. Well, read on, because here is a nifty little "integrated" Word Processor, Spreadsheet, and Data Manager all rolled into one disk. Trio-128 was a pleasant surprise! I ordered and received it several months ago but just haven't had the chance to try it out. It will make this column slightly longer than usual but the three programs deserve separate handling.

Trio-Word

Trio-Word is the word processor part in the trilogy. Trio-word is a full featured word processor. The only serious short coming I found was its lack of a spell checker! A spell checker has become such a normal, expected part of a word processor that its lack turns me against it. Without the spell checker, I couldn't recommend it to you—unless you are one of those insufferable people who can actually spell! A thesaurus and outliner would be nice, but they aren't so common in word processors that they are missed.

Most of the other common word processing features are there including some niceties that are uncommon. For example, it has a very handy document preview screen. You can scroll through your document and see the way it will look on paper including headers, page numbering, and page breaks. This feature, however, will not let you see the proportions of your page. A few word processors (a very few), in the view mode, present the page reduced in size small enough for you to see the whole page on the screen. This, of course, is too small for you to read, but you can see if the text is centered on the page or if there is too much white (blank space) between the letterhead and the date. For you trivia buffs, this is called "greeking." It is the process of replacing alphanumerics with little squiggles and dots but keeping the proportions correct.

Trio-128 loads very fast. The main menu loads up almost immediately. From it you choose either Trio-Word, Trio-Calc, or Trio-File. I expected that since the menu loaded so fast, the long delay would take place loading one of these selections but they, too loaded surprisingly fast. The programmers, for some reason, did not switch to the Commodore 128 "FAST" mode as the menu loads but did switch as the next modules load.

The documentation provides a "Quick Start" list of commands. If you are very familiar with word processors, this might just be enough for you to use Trio, the documentation says, but as a quick reference it leaves a lot to be desired. They should have put the desired result in alphabetical order first; then the command that will do it so that you can look up what you need to do. Unfortunately, most document writers do it the other way—that is: they put the command first then what it does. Almost useless to me.

A nice feature is that Trio-Word uses standard keystrokes when possible. For example: when you want to delete the character to the left of the cursor on a Commodore, you press the DEL button. Why do some programmers feel they have to change that and use their own—like using the left arrow to delete left? It just creates a longer learning curve for their program! Trio also uses the HELP key for help and the cursor keys work in the normal way.

The wordwrap works well and automatically! You don't have to reformat when you edit a line. If you decide to justify your document, it does not show justified on the screen but it does when you preview it. Most of the commands are displayed on the top and bottom of your screen so they are very easy to remember. Detailed help windows pop-up so that help is readily available.

You are able to look at the directory of disks in either drive, but you can't load from the directory. You must type in the name of the file you want to load. There is an "undelete" feature that allows you to change your mind about deleting a block of data; unfortunately it only works on block deletes not on any function. The "Klipboard" feature allows you to save blocks of information, addresses, etc. that can be added to your letter whenever you desire.

For the serious student, footers are desirable but headers are a must for writing assignments. Trio Word provides for headers but not footers. Single line headers can be placed at the top of every page (after the first) and can be centered, flushed right or left but not all three. You can number the pages, starting on page two, but you can't choose where the number will be. The pages are numbered at the bottom center. There is no provision for footnotes, but more and more professors are allowing the use of all endnotes instead—a nod to the proliferation of word processors that can't do footnotes (except manually).

Your entire document is kept in memory, as it is in most word processors (the most notable exception is Wordstar). Your document, therefore, is limited in size to the memory of your computer. This, for most purposes, is more than enough. If it isn't, however, you can "link" files when you start to print. For example: You can name each file CHAPTER1, CHAPTER2, CHAPTER3, etc. When you start to print your book, you tell Trio at the end of each chapter what the name of

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ADAM

The ADAM Forum continued from page 299

would reenter the home computer market. Such speculation was fueled by rumors Coleco had vast quantities of ADAM products (some never released) in storage. There rumors are given credence by reports several ADAM dealers are negotiating to purchase Coleco's entire remaining inventory of ADAM products. A more serious side effect of Coleco's action is Honeywell no longer repairs ADAM computers. Serious, but far from critical. Quality repair service has been available from several ADAM organizations for almost four years. There is no reason to believe such services will not be available in the future.

Son Of ColecoVision

Telegames USA [Box 901, Lancaster, TX 75146, (214) 227-7694] a major supplier of ColecoVision game cartridges and accessories, has released the Personal Arcade ($70), a ColecoVision compatible game unit. The main interest to ADAM owners is the possibility new games will be written for the system, games which may be played on both the ADAM and ColecoVision. There are even rumors of adapters which will allow Nintendo and SEGA game systems to use ColecoVision cartridges. Considering the quality graphics possible with ColecoVision, and the current resurgence of video games, the introduction of the Personal Arcade should prove to be of tremendous benefit to ADAM users.

Orphanware BBS

Most ADAM users are familiar with the wide variety of products offered by Orphanware [5665 Myers Road, Akron, OH 44319, (216) 882-4720] but many don't know about or have never called the OBBS. The OBBS is probably the most unusual ADAM BBS operating today. At last count the board used eight (thats right, eight) disk drives of various capacities, a 256K RAM expander, and an external serial interface with a 300/1200/2400 baud modem.

Besides the usual message bases and file upload/download areas, this BBS offers a few extras. Because Orphanware is a driving force in the ADAM market, many other ADAM dealers frequent this BBS. Whenever a circumstance of special importance to ADAM dealers arises, you are sure to find an active discussion. This provides an excellent opportunity for ADAM users to go one-on-one with ADAM dealers, especially "Big John" of Orphanware.

OBS products may be ordered via the BBS, and special sales available only on this board are usually in effect. I would suggest ordering Orphanware products through the BBS for two reasons; frequent specials and a more congenial (and direct) method of doing business.

The OBBS operates daily from 5 pm to 8 am at 216-882-4720 and is PC Pursuitable. Set your telecommunications software to Full Duplex, 8 Data Bits, 1 Stop Bit (plus Word Wrap On and Character Filter Off for ADAMLink).

New Newsletter And Free Gift

We have all seen ads which promise a free gift simply for inquiring about a particular product. Typically the so-called gift is something unique and exciting; like a five cent decal not worth the postage required to receive it. Well pardon me as I don my P.T. Barnum hat and tell you about an offer (almost) too good to be true.

ADAMZONE Publishing Company [17 Capstan Road, West Milford, NJ 07480-4816], associated with Eric Danz's ADAMzap Software Company, was scheduled to publish the premiere issue of "NetworkADAM NewsINFO Letter" in September. ADAMZONE will send the premiere issue to any ADAM user who sends them an SASE. No, the SASE is not for the newsletter. The newsletter will be sent separately. Instead, you will receive an ADAMzap catalog and a coupon for a free gift (okay, you pay $3 postage but the gift is free). Since ADAMZONE choose not to announce exactly what the gift is, I won't spoil an unexpected but pleasant surprise. Go ahead, splurge on a few stamps, you won't be disappointed.

Inexpensive Hand Controllers

Radio Shack has received another shipment of original equipment Coleco hand controllers. Unlike last years offering which was largely composed of used equipment, the current stock appears to be in excellent condition. Last time you could have any color you wanted, so long as it was black. This time white seems to be the color of choice. At a mere $3 each, its a good time to pick up a few replacement or back-up units. Don't delay, last years stock sold out very quickly and I doubt if any more will be offered.

Coming Attractions

As I prepare for my first vacation in three years, my thoughts drift farther and farther from my next column. But as always, I will attempt to bring you the interesting and unusual in the ADAM community.

I am always happy to hear from fellow ADAM Users. Contact me via US Mail in care of the Triangle ADAM Users, 2623-A Yanceyville St., Greensboro NC 27405-4407. Due to the volume of mail I receive, you must enclose an SASE if you want a reply. I may be reached by E-Mail on American People Link (PAPPASPM), Compuserve (72277,3303), or FIDO Net's ADAM Echo (151/2). ●

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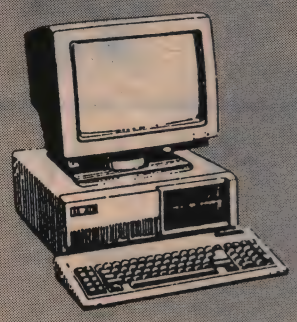

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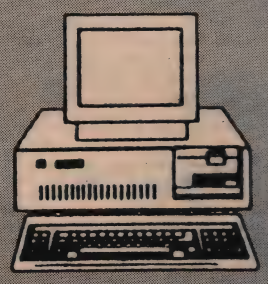

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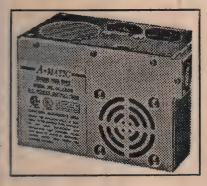

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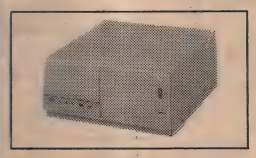

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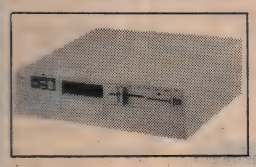

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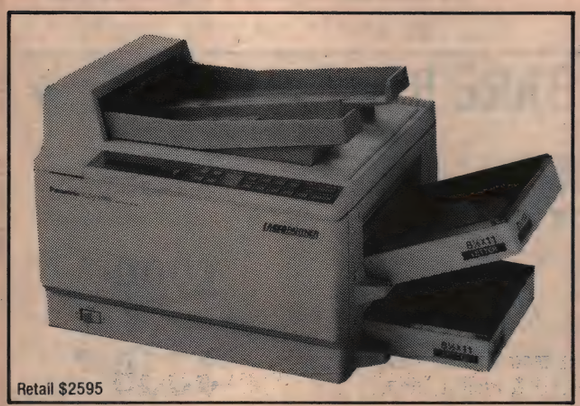

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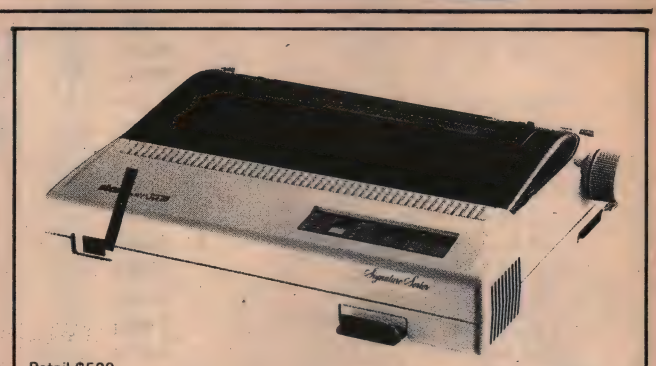
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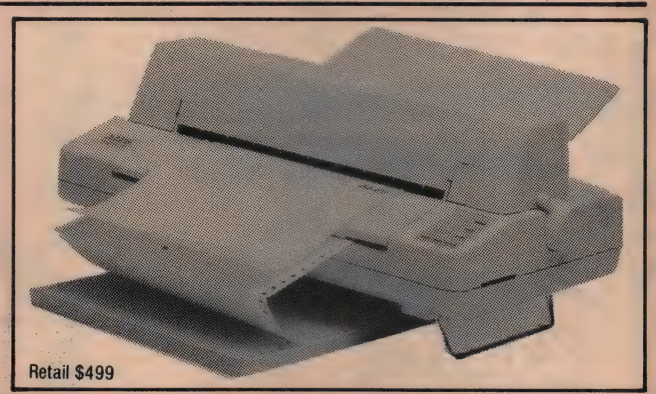
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MISCELLANEOUS

MIDI Column

by Jeff Burger

Sequencer Overview

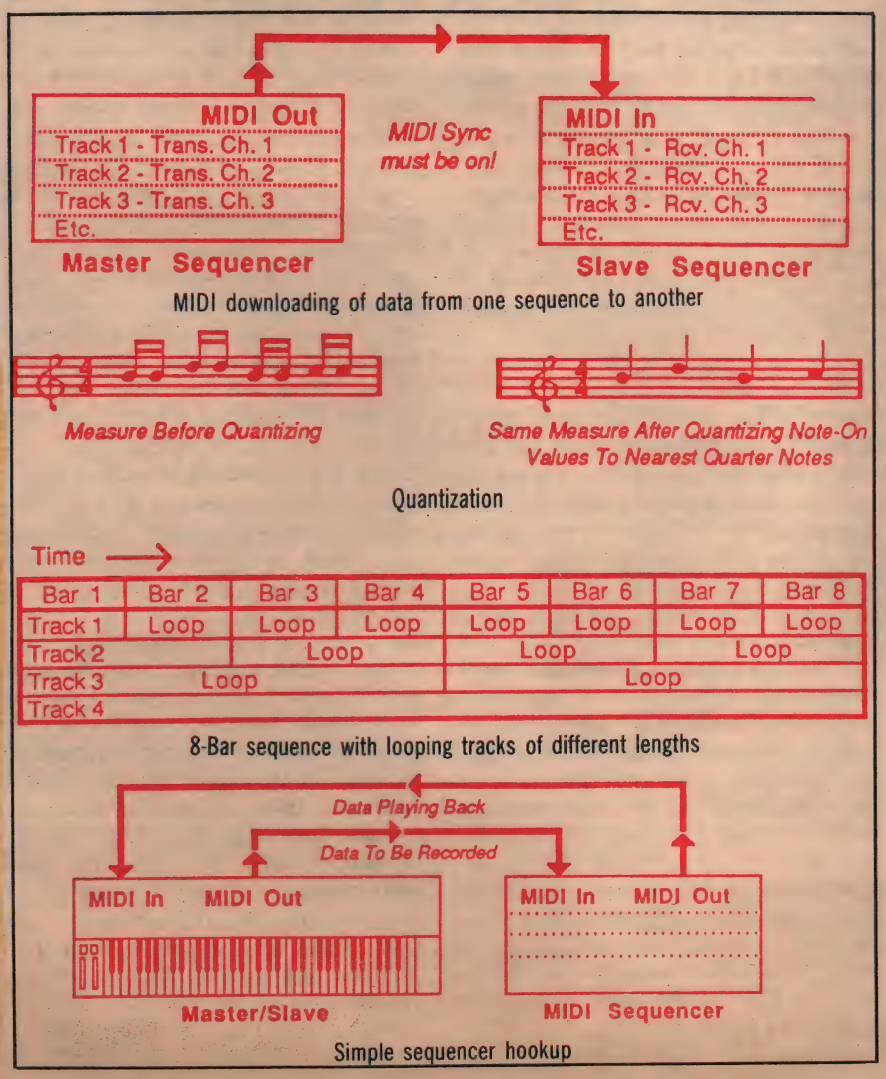
Just as electronic music has become an irrefutable part of today's multimedia productions, sequencers have become an indispensable tool for MIDI musicians. More and more, sequencers serve as the brains of the operation in both composition and performance, controlling synths, samplers and drum machines—even signal processors and lighting. Along the way, grumblings about musicians being replaced by machines have more or less given way to kudos for sequencers as productivity tools. Just as every musician's needs are different, no one sequencer does everything right and has every feature.

The modern sequencer weds the best of the multi-track tape recorder to the microprocessor without the disadvantages of magnetic recording. There's no tape to stretch or wear out and relocation is instantaneous. Editing is precise across a wide variety of parameters and sections can be cut, pasted, copied and otherwise manipulated much easier than with conventional media.

The first sequencers were hardware devices with limited capabilities. While the modern hardware sequencer is far more sophisticated, the trend is growing toward using sequencing software and a MIDI interface with personal computers for several reasons. First, why pay for more hardware when you've already got it in the form of a computer. First time computer buyers can put the money into one device and use it for sequencing, word processing, games, business, etc. as well. Dedicated hardware sequencers are typically less updatable than their software counterparts. Finally, the computer provides a much larger window on your musical world than does a hardware LED display.

What's It Do? MIDI sequencers at their lowest level are MIDI recorder/players, recording data received from a MIDI device such as a keyboard and sending it back out on playback to one or more MIDI devices. To stress a point, sequencers do not record sound, they record performances. A player piano gets its performance information from a piano roll, but the sound still comes from the piano. The relationship is the same with sequencers and instruments.

Like tape machines, most models today work on a multi-track basis. You can think of tracks as running in parallel like the lanes on a freeway. Usually each track is built up one at a time. On playback, each track's MIDI output is transmitted on a given MIDI channel.


MIDI Out
Track 1 - Trans. Ch. 1
Track 2 - Trans. Ch. 2
Track 3 - Trans. Ch. 3
Etc.
Master Sequencer
MIDI Sync must be on!
MIDI In
Track 1 - Rcv. Ch. 1
Track 2 - Rcv. Ch. 2
Track 3 - Rcv. Ch. 3
Etc.
Slave Sequencer
MIDI downloading of data from one sequence to another
Measure Before Quantizing
Same Measure After Quantizing Note-On Values To Nearest Quarter Notes
Quantization
Time
Bar 1 Bar 2 Bar 3 Bar 4 Bar 5 Bar 6 Bar 7 Bar 8
Track 1 Loop Loop Loop Loop Loop Loop Loop Loop
Track 2 Loop Loop Loop
Track 3 Loop Loop
Track 4
8-Bar sequence with looping tracks of different lengths
Data Playing Back
Data To Be Recorded
MIDI In MIDI Out
Master/Slave
MIDI In MIDJ Out
MIDI Sequencer
Simple sequencer hookup

In this way one track might play a bass synthesizer on one MIDI channel, while another track plays chords on an instrument receiving on a different channel. It's important to understand the difference between tracks and channels—the track contains the MIDI performance, while the channel determines the routing of the performance to various external devices.

Generally, the number of tracks you need equals the number of simultaneous musical parts you want to play back, monophonic or polyphonic. This doesn't necessarily mean that you need one track for each instrument, however. For example, multi-timbral instruments can provide more than one sound at a given time via different MIDI channels. For example, several polyphonic tracks may each run a separate polyphonic instrument while several other monophonic tracks each control a different voice on one multi-timbral instrument. In another scenario, you may wish to score parts for a MIDI drum machine right from the sequencer, with each drum on a different track for editing flexibility (yet all routed to the single channel the drum machine is receiving on).

Another trend employs a limited number of tracks with unlimited bouncing capabilities. This way you wind up with more than one channel's worth of information on a single track. As a rule this provides for reduced flexibility and is not optimum for editing and other changes. While bouncing is a desirable feature, it is not recommended that you rely on it as a substitute for a reasonable number of tracks.

Recording More Than One Track At A Time. While some sequencers can only record one track at a time, you may find it valuable to record multiple tracks simultaneously. Example: a split keyboard might send out left- and right-hand parts on two different MIDI channels which you want recorded on separate tracks. Guitar controllers often transmit data for each string on a separate channel, which means you may need to be able to record as many as 6 channels simultaneously. There's also the increasing potential for recording jams between MIDI musicians (each transmitting on a different channel), however this requires either additional MIDI In jacks or a MIDI Merge device (see "Little Black Boxes").

Sometimes its advantageous to download multi-track/multi-channel songs from other sequencers. (Many professional musicians use a computer-based sequencer for composition and studio work before transferring the work to a dedicated hardware sequencer to withstand the abuses of travel and live performance. This is done by synchronizing the two sequencers with MIDI Sync and recording on all tracks of the slave while playing all tracks on the master.) All of these applications require each track to be able to record information coming in on different MIDI channels.

Problem:

How can a split keyboard be used to record bass and chord separately but simultaneously with a sequencer that can record more than one track at a time. Assume the bass sound on the left half of the split is set to send and receive on Channel 1 and the chord sound on the right half of the keyboard is set to send and receive on Channel 2.

Solution:

1) Connect the split keyboard's MIDI Out to the sequencer's MIDI In and the sequencer's MIDI Out back to the keyboard's MIDI In.

2) Select a track to record the bass line on and set it to send and receive on Channel 1.

3) Select a track to record the chord pattern on and set it to send and receive on Channel 2.

4) Put the sequencer in record and play both lines simultaneously.

5) Stop the sequencer and initiate playback. Both lines should play back on the correct parts of the keyboard.

Let's say we're recording using a soundless master controller and a rack of slaves—while we're recording we need to hear the remote devices a track is designed to play back on. What we need is for the information coming in the sequencer's MIDI In port to be echoed at the MIDI Out port. While some sequencers have a hardware MIDI Thru, tedious re-patching between MIDI Thru and MIDI Out is required just to audition the track you just recorded. A far better solution is to have the software switch the MIDI Out to act as a MIDI Thru on the individual tracks. This is often referred to as a "Software Thru" or "MIDI Echo."

Real-Time vs. Step Time Recording. Real-time recording refers to the process of performing the tracks live into the sequencer. This process can be enhanced by slowing the tempo while recording and speeding it back up for playback. Tracks can be perfected further by using quantization or error-correction to move the notes from your performance to the closest timing value you specify (like correct every Note On event to the nearest 1/8th note. Be aware that some quantization schemes move the entire note and preserve the original duration, others move only the note-on which changes the duration and still others can actually quantize both the note-on and note-off events, preferably independent of one another. (The later is crucial if you plan to dump the sequences into a notation or transcription program or you'll get written passages Frank Zappa wouldn't

continued on page 308

EISA May Make The Data Highway Wider, But At Higher Cost

by Carl Warren

The plethora of new 32-bit microprocessors are causing system engineers to rethink how they want to implement the bus system. Slapping a 32-bit processor, such as the Intel 80386 on a 16-bit bus is workable, indeed everyone, including Intel has done it, but it isn't optimum. The ideal situation is to employ a conduit wide enough to manage the entire word width, but still support 8 and 16-bit system cards.

Compaq Computer took the 386 lead early on with an approach that matched a 32-bit memory path to the 16-bit AT bus. Essentially this was a private memory bus and matched no specs except Compaq's. But support of single-company (not necessarily proprietary) buses doesn't come easily or cheaply. The industry hasn't run out in droves to try and make memory boards.

IBM, on the other hand, has taken the approach of developing a new conduit called the Micro Channel Architecture. This is a high-speed I/O channel that supports 16 and 32, and eventually 64-bit data, and address transfers. Unlike most microcomputer buses, MCA is built around mainframe type technology and is a variation of the Hyperchannel. Therefore, DMA bursts, multiple masters and slaves are taken into account.

The argument made against MCA is that its a closed architecture. Yes it is. IBM is encouraging third party vendors to get on the MCA bus and has developed ways of assisting them. And vendors can obtain a license. The license is expensive and demands a 5 to 8 percent royalty—a price tag that manufacturers like Dell, Tandy and Zenith can't withstand. Whether IBM can enforce patents, or in some cases even obtain them, is a matter of conjecture. My estimate is that they couldn't defend several of the applied for patents on MCA. However, they have patents and can defend many on the underlying technology.

The Gang Of 9

Taking the approach that a good offense is better than a defense, nine members of the industry, led by Compaq, and including AST Research, Inc., Epson America, Inc., Hewlett-Packard Co., NEC Corp., Ing C. Olivetti & Co., Tandy Corp., Wyse Technology and Zenith Data Systems Corp., have decided to challenge IBM head-on. The challenge is with the EISA (Extended Industry Standard Architecture). The EISA is the latest approach to 32-bit architectures. The EISA uses the AT bus technology and extends it to 32-bits. Moreover, it still employs Compaq's CPU to memory scheme to reduce bandwidth overhead on the main I/O channel.

The extension isn't just adding 16 more data and address lines, but provides support for: Burst mode DMA, multiple masters, full address decoding and bus arbitration, additional control lines and byte ordering and transfer. Thus an 8-bit card can make a transfer to a 32-bit card and vice versa. Or at least the claim of doing is made.

Compaq is laying claim to inventing the approach and suggests that conformance to EISA sidesteps any license or patent rights of IBM.

Not so. There are eight patents protecting the AT channel. These include: 3812475 (the Christenson patent), 4575826, 4809113, 4437093, 4460957, 4570161, 4580135, and RE 32201 (the latter pertains to the reissuance of the Computer Automation patent on memory management and addressing). These patents cover everything from what a bus is, to keyboard and DMA control, to how memory is addressed.

Moreover, the extension to 32-bits on the AT bus was developed in 1986 as part of the emerging IEEE P-996 standard—which is planning on submitting a final document for industry voting this November.

In 1986, the industry got together to form a committee known as PC/ET (Personal Computer Extended Technology). The goal of this committee, which I was the founding chair, was to standardize the AT bus and extend it to 32-bits. The PC/ET group became IEEE P-996—a standardized activity of the IEEE computer society. Although it has been reported that PC/ET and P-996 disappeared, it didn't. Indeed, the effort has been maintained by a core group of individuals (an IEEE activity is represented by individuals, not companies as is ANSI). The results of their efforts will soon be seen.

The original extension to 32-bits, defined by PC/ET, was a collaborative effort with the work being done by Scott Hopkinson of Emulex and Holden Jessup of Olivetti. This definition called for burst DMA, support of multiple masters and slaves, IDs on the boards and would support any high-perfor-

continued on page 564

MIDI Column
continued from page 307

touch.) Some systems quantize while recording and others quantize after-the-fact as an editing function.

Step-recording refers to the process of recording each individual event manually, typically by specifying a rhythmic value on the sequencer and playing one or more notes on the master device. While metronomic passages are relatively easy to achieve via step-entry, only those very comfortable with the ins and outs of written notation or those lacking dexterity should attempt to enter more complex compositions in step mode.

The best choice is to have a choice. The optimum sequencer would have both modes so they can each be employed for what they do best. For example, you might want to record the bulk of a piece in real time, but switch over to step recording to enter cascading 16th note arpeggios.

Lengths And Loops. Track length is determined in different ways on various models. Many systems require the musician to specify the track length beforehand and recording stops after reaching that point. Other systems allow you to play as long a line as you wish, terminating either at the point when you hit the "STOP" button/footswitch or at the last note played before using the "STOP" command.

Some systems force each track in a given section like a verse (more on sections in a sec...) to be of the same length. Consider a passage that has 8-bars of unique chord changes on one track parallel to another track which repeats a 1-bar bass ostinato. In a forced-track-length sequencer, you would have to manually play the 1-bar line eight times. Other brands have the provision for a section to have tracks of independent lengths, with the shorter tracks looping (i.e. repeating over and over) automatically at their own end-points for the duration of the longest track. If that looping doesn't happen automatically, it would be wise to look for the ability to specify a number of loops or append a track section to itself end-on-end within a section.

The last aspect of looping to consider is whether entire sections (like our 8-bar example) loop while you're working on them-like most drum machine patterns do. If they do, some products even let you continue recording on subsequent passes either doing overdubs on the same track or replacing the previous take with a new one. Undo commands would then let you revert back to the original in the latter case.

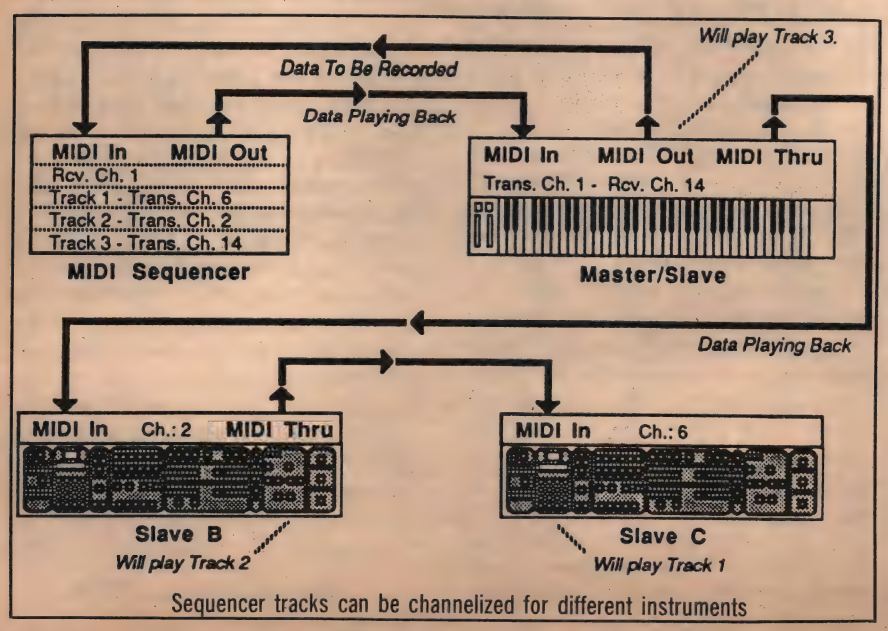
The Good, The Bad And The Ugly. Even the best players make mistakes, sometimes flubbing a single note in an otherwise perfect take. The same real-time and step mode concepts apply to cleaning up the bloopers. The real-time solution entails punch-in/punch-out. In manual mode this resembles the same procedure used on a multi-track deck and a footswitch is often desirable. Many sequencers allow the process to be automated by setting a punch-in time and punch-out time so you can concentrate on playing instead of punchng in the proper cracks.

Step-editing can be pretty vicious if you have to work blind (in other words if there's no readout of where you are in the track). However, if an appropriate display is provided you can not only tell where you are in a sea of events, but you can access and edit all kinds of information besides notes—velocity, after-touch, program changes, performance controls and more. Sometimes you need not even play the notes you want to change; with graphics-intensive computers, you can often make any necessary changes right on the computer screen itself. Some programs will display what you've played in standard notation, and you can delete and add notes at will right on the screen. Another popular method displays notes as bars against a grid and resembles a player piano roll.

Editing falls into three levels—single events, global or regional. You may want to change a single event, all events on a track or sequence or just those events which fall within a specified range. In addition, some units provide the advanced feature of scaling certain types of information. In this way all the velocities within a given range of events might be scaled from low to high to create a crescendo. Another possibility would be to decrease the overall level of a track by scaling all the velocities to, say, half of their existing values.

Next month we'll discuss how sequencing software makes the songwriting and arranging process a snap. Until then, happy sequencing!

This column is excerpted by permission from *The Murphy's Law MIDI Book* by Jeff Burger, available through Alexander Publishing (805-499-6200). ●


Will play Track 3.
Data To Be Recorded
Data Playing Back
MIDI In MIDI Out
Rcv. Ch. 1
Track 1 - Trans. Ch. 6
Track 2 - Trans. Ch. 2
Track 3 - Trans. Ch. 14
MIDI Sequencer
MIDI In MIDI Out MIDI Thru
Trans. Ch. 1 - Rcv. Ch. 14
Master/Slave
Data Playing Back
MIDI In Ch.: 2 MIDI Thru
Slave B
Will play Track 2
MIDI In Ch.: 6
Slave C
Will play Track 1
Sequencer tracks can be channelized for different instruments

Wheel Ease Software Guide

GP Technologies, manufacturer of printwheels and IBM Selectric typewriter elements in the United States, has announced the introduction of the Wheel Ease Software Guide, an innovative and easy-to-use reference guide for ten of the most widely used IBM and IBM-compatible software packages.

Wheel Ease is an inexpensive and innovative approach to mastering the full spectrum of commands for any of ten of the most popular MSDOS software packages, including Word Perfect 4/4.1, WordStar ("Professional" 4.0 and "Original" 1.0-3.3 versions), CrossTalk XVI 3.6, Lotus 1-2-3 1.XX, MSDOS 2.XX & 3.XX, MS-Word 3.1, DisplayWrite 4 1.0, MultiMate Advantage 3.6 and dBase III Plus 1.1.

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Wheel Ease carries a suggested list price of $12.95 and is available through direct-mail catalog houses, computer and software retailers as well as from GP Technologies.

For more information contact GP Technologies, 160 Meister Avenue, Somerville, NJ 08876; (201) 722-7117. ●

Quadram Announces OS/2 Support For PS/2 Line

Quadram has announced that its Quadboard PS/Q and QuadMEG PS/Q can now support up to 4Mb of memory while providing 100% compatibility with OS/2 extended memory.

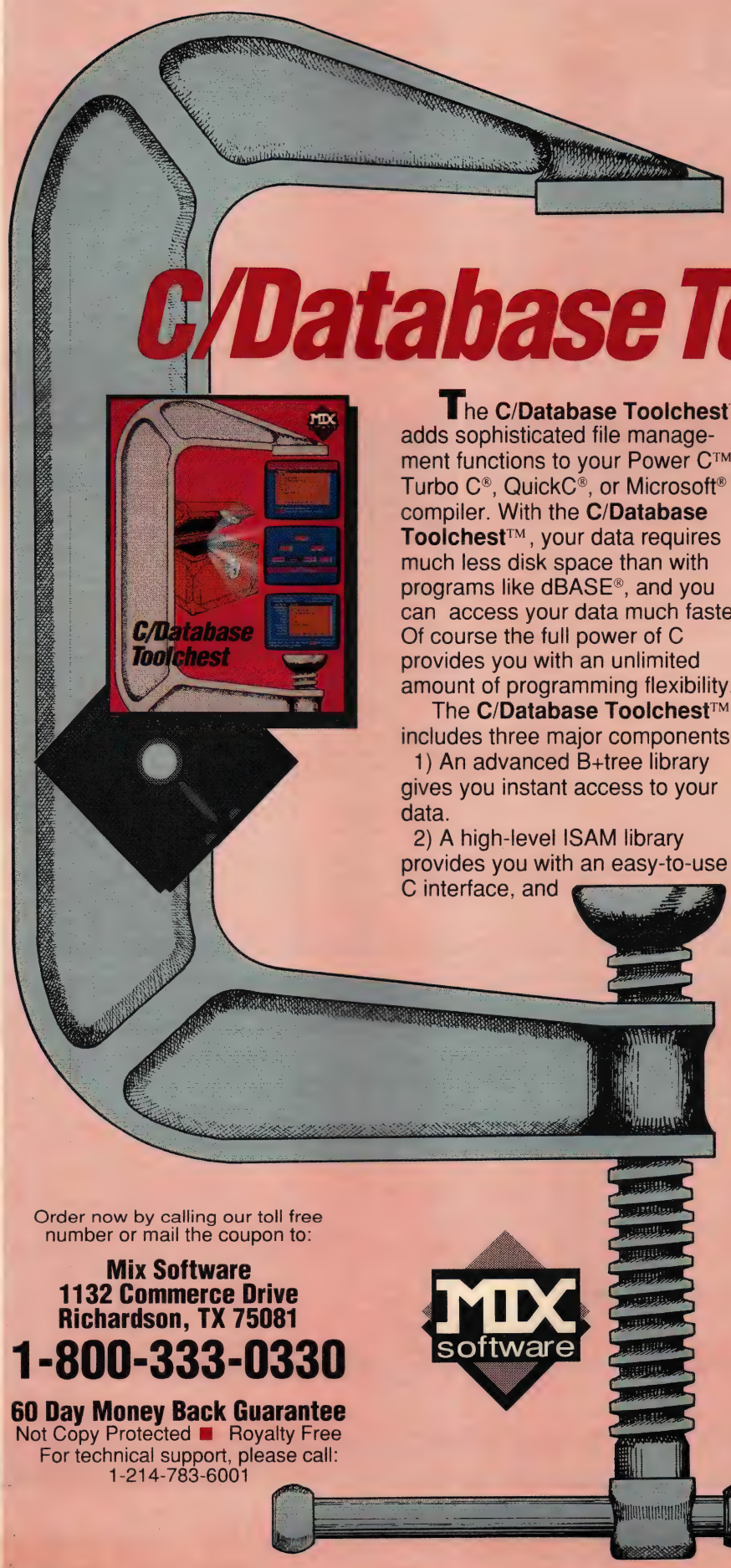
Users of these enhancement boards designed for IBM PS/2 Models 50 and 60, can add from 512K up to 4Mb of memory with either board. Drivers for each ensuring Lotus/Intel/Microsoft (LIM) 4.0 software compatibility are available. Switch selectability between extended memory and LIM 4.0 is available as well.

Another notable feature of the boards is their switch selectable Micro Channel ID to prevent conflict with other expansion boards installed in the computer. Both boards are also supported by the programmable option select (POS) feature, which does away with the need for setting dip switches by positioning the boards via software. Quadboard PS/Q and QuadMEG PS/Q are recognized by the system at cold boot.

QuadMEG PS/Q is a memory enhancement board, offering from 512K to 4Mb of memory. Quadboard PS/Q, true multifunction board, goes one step beyond the QuadMEG PS/Q by offering I/O. Besides providing all the memory features of the QuadMEG PS/Q, Quadboard PS/Q is equipped with a bi-directional parallel port (addressable as LPT1 or LPT3) and an RS-232C serial port (addressable as COM1 through COM7). This makes the Quadboard PS/Q one of the few boards on the market with I/O and memory available on the same card. Most others have an additional daughter card that provides I/O.

Prices for the QuadMEG PS/Q begin at $395 without memory and $545 for 512K while Quadboard PS/Q retails for $595 without memory and $745 with 512K. Both are presently shipping.

For further information contact: Quadram, One Quad Way, Norcross, GA 30093-2919; 404-923-6666. ●



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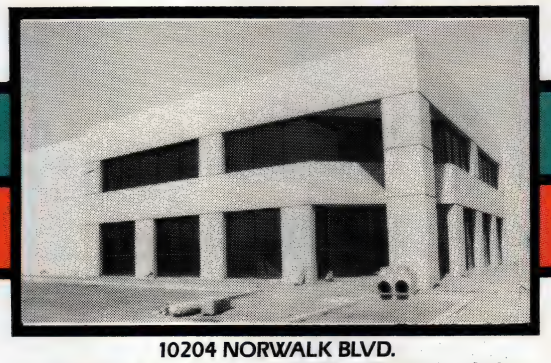

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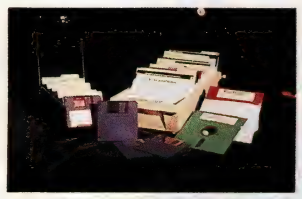

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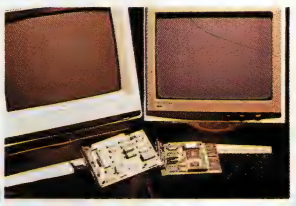

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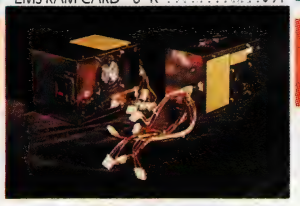

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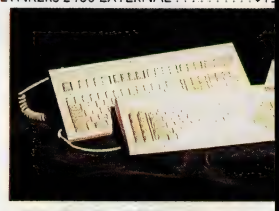

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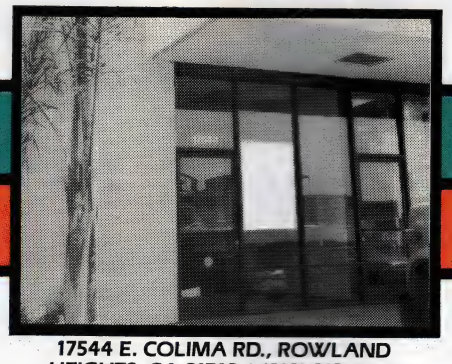

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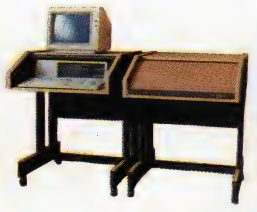

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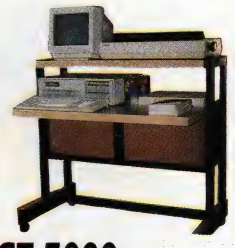

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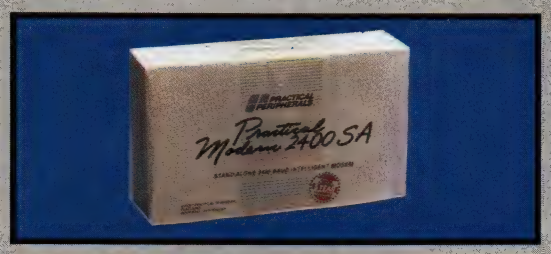

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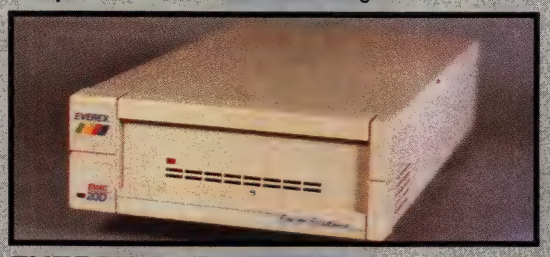

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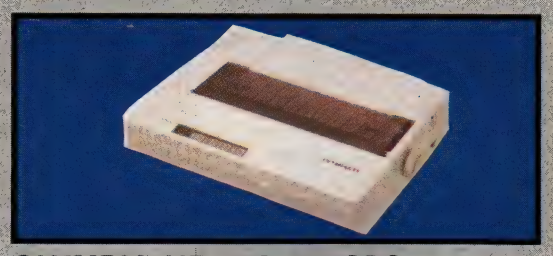

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A510

COMPUTER STARTER

Ask Dr. John

by John Heilborn

Q. I have been unable to run a variety of educational programs that were written in compiled BASIC (I have an IBM clone). Every time I run them the computer locks up completely. Recently I noticed an advertisement for BASIC ROMs. The dealer from which I bought my computer had never heard of anyone adding BASIC ROMs to a clone.

Do you think that they might help me to run these programs?

GJ

A. While it's true that there are some differences between IBM BASIC (and BASICA) and other BASICs such as GWBASIC that may cause this problem, usually compiled BASIC does not cause this. You see, IBM BASIC and BASICA are not compiled languages, they are interpreters and most compiled BASICs are stand-alone products that produce code (programs) that should run on any machine.

My guess is that the software that you are running may not be fully stand-alone. Some BASICs (even compiled BASICs) require the BASIC program be present while its programs are running. This is because the program requires some library routines that are contained in the main program.

Before you go off and buy any ROMs, I'd suggest checking with the software vendor who supplied the programs to you. You may find that they require some version of BASIC to be present (non-ROM).

Also, while there are several versions of legal clone ROM BIOS chips, I do not know of any legal BASIC and BASICA ROMS. Before you make any purchases, you may want to check with your vendor to make sure the chips you're buying don't have an IBM trademark on them. If they do, stay away from them. Only IBM and IBM dealers supply IBM parts.

Q. I have an XT compatible which I use for both school work and for maintaining inventory files. Since IBM does not have much educational software, I have been considering obtaining an Apple II or a Macintosh.

However, I recently saw an advertisement for a product called MatchPoint-PC which is a card that makes an IBM PC compatible with both Apple IIs and Macs.

My question is: Is it really 100% compatible and can I change my PC into an Apple and back at any time? If this works, why would anyone want to buy an Apple and pay the thousands of dollars?

RK

A. Until you mentioned it, I had not heard of MatchPoint-PC. However, looking at the ad, it appears that all it does is allow you to read and write Apple II diskettes on a PC. It does not allow you to run Apple II programs; nor does it read and write both Apple II and Mac diskettes. For the Mac, they have a separate product that requires both a PC board and an external Mac drive.

In any event, neither of these prod-

continued on page 326

Your BASIC Backpack

If you can read a comic book or a newspaper, you can learn to read and understand programs in BASIC. Well, you can if the programs are written so as to encourage humans to understand them. That's how we try to write programs in "Your BASIC Backpack."

You can learn to read and understand BASIC, express yourself in BASIC, and use it to make the computer do what you want it to do the way you want it done.

"Your BASIC Backpack" provides tutorials for beginners who want to learn how to use Microsoft BASIC and QuickBASIC. We also pose problems for you to think about, play with, and solve.

We pose more problems than we can solve in our allotment of pages, so tell us which ones to solve. If you want a reply, send a self-addressed, stamped envelope. Send your comments, suggestions, complaints, kudos, whatever...to **Bob & Don, P.O. Box 1635, Sebastopol, CA 95473.**

The Deskmate Connection

While Arrogant Apple runs around trying to trash other companies that want to use the "look and feel" pioneered by Xerox before Apple existed, Tandy is quietly making available the "look and feel" that could quickly become the dominant "graphic interface" for most of us. It's called **Deskmate**.

Deskmate has the potential to become the world's most used and useful graphical interface. There are more than **25 million** computers in use that can use it. It runs on inexpensive 8088 and 8086 machines with only 384K RAM, as well as the more expensive 80286 and 80386 computers. The new Tandy computers, the 1000SL and 1000TL, have the Deskmate interface in ROM, a most important leap forward for beginners, novices, and others who want to use a computer with the least amount of fuss & bother.

In "The ShareWare Teacher," (ShareWare magazine), a bunch of us are proposing Microsoft QuickBASIC as the common development language and Deskmate as the universal interface for educational shareware. If this is of interest, contact Wenden Wiegand, Alpine concepts, 305 Chelsea Way, Redwood City, CA 94061.

I (Bob) would like to hear from people who use Deskmate on Tandy or other computers. If all goes well, much of my future writing will be about machines like the new Tandy 1000SL and 1000TL, the best all around, general purpose computers I have seen for beginners in my 26 years of writing "teach yourself" computer stuff.

Teach Yourself BASIC

This section is for beginners. We'll try to help you learn how to read and understand Microsoft BASIC for the Volkscomputers, the ubiquitous MS-DOS machines. This section began in the January, 1988 issue of COMPUTER SHOPPER. In previous episodes, we used the following **keywords** that BASIC understands.

BEEP	END	KEY OFF	PRINT	RUN
CHR$	FOR...NEXT	KEY ON	PRINT USING	SCREEN
CIRCLE	GOTO	LINE	PSET	SOUND
CLS	IF...THEN	LIST	RANDOMIZE	TIME$
COLOR	INPUT	LOCATE	READ	TIMER
DATA	INPUT$	NEW	RESTORE	WIDTH
DATE$	INT	PAINT	RND	

We show keywords in all upper case letters and variables in lower case or a mixture of upper and lower case letters. We do this to make our programs easy for you to read and understand. HOWEVER, when you LIST a program on your computer, don't be surprised if variables appear in all upper case. If your BASIC preserves the style we want, that is a big + for the BASIC you are using.

Scramble an Array

In building computer games and simulations, we sometimes want to scramble a list of numbers. For example, if we use integers 1 to 52 to represent the 52 cards in a deck of cards, we may want to "shuffle the deck." Or perhaps we want to scramble the 365 days in a year. In testing a sorting program, it is nice to be able to generate a scrambled list of numbers from 1 to n. We know how the list should look when properly sorted (1, 2, 3,..., n) and so we can tell if our sort is working.

So let's build a program, block by block, to generate an array of integers from 1 to n, then scramble the numbers in the array. Here is a REM outline of the program.

```
1 REM ** Scramble an Array of Numbers, 1 to n **

100 REM ** Set up **

200 REM ** Get number of array elements to generate **

300 REM ** Generate the original (unscrambled) array **

400 REM ** Print the original (unscrambled) array **

500 REM ** Scramble the array **

600 REM ** Print the scrambled array **

700 REM ** Tell how to do again **
```

When we run the program, we want it to go something like this.

```
How many numbers? 7

Here are the original (unscrambled) numbers:

1               2               3               4               5
6               7

Here are your mixed-up numbers:

5               1               2               6               4
7               3

To do again, press any key.
```

continued on page 318

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DOS Help! For PC/MSDOS

by Fred Blechman

If you're an IBM PC or compatible user, at some point you've had to come face-to-face with PC-DOS, or it's generic sister, MSDOS. This is when you discovered that the command you needed most—HELP—was not provided by DOS. Never fear, however, since Flambeaux Software is here—with a neat utility/tutorial program called DOS Help!.

DOS Help! supplies instant, easy-to-understand information about the IBM PC Disk Operating System (DOS). Whether you're a veteran PC user or just getting started, you can put aside that hard-to-read DOS manual. You'll actually enjoy using this electronic replacement for the DOS manual.

There has been an avalanche of DOS tutorial books and programs, all of which attempt to simplify and clarify the DOS manuals. While most of these are easier to understand than the manuals, they generally lack two features. They are not on line—that is, available to the screen when needed. Also, they are not context sensitive in providing help with the particular com-

continued on page 325

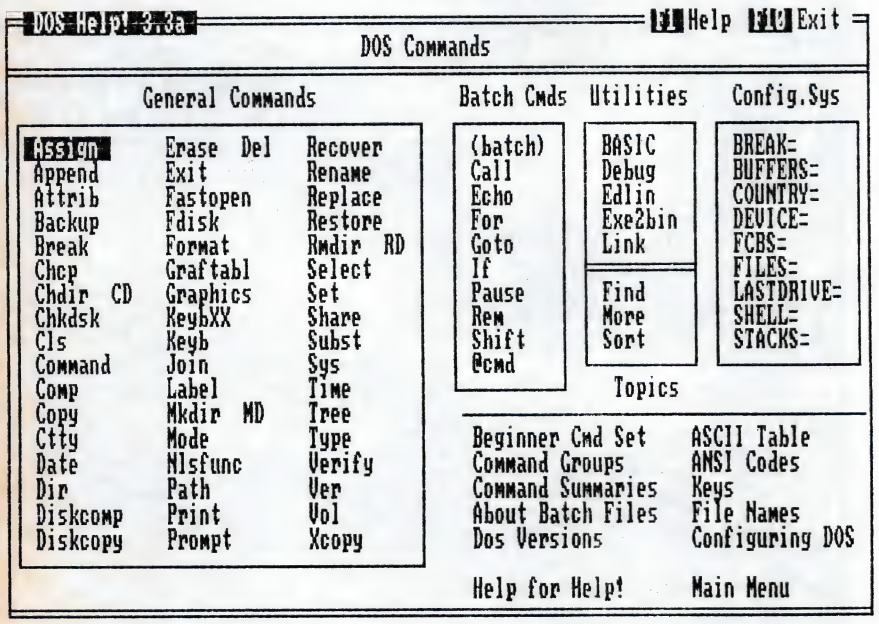


Figure 1—DOS commands.

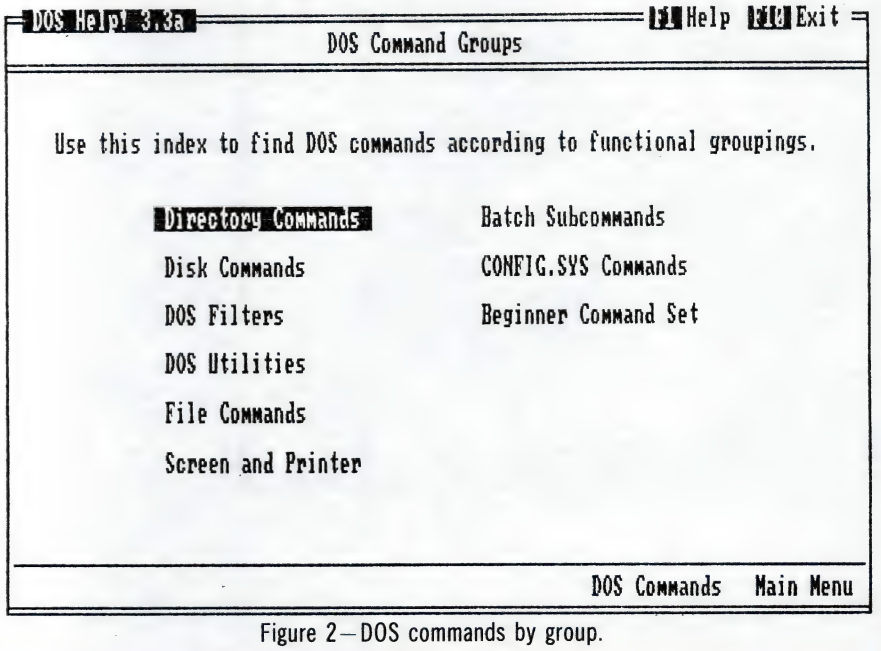


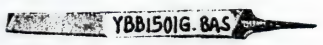
Figure 2—DOS commands by group.

BASIC Backpack continued from page 316

To do another, press almost any key, or use CTRL BREAK to stop the program. And now -- on to the program. Easy to write, since we already have a REM outline and have already designed the way we want the screen to look.

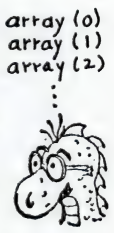
As usual, Block 1 consists only of information about the program, its name, where it appeared, the version of BASIC in which it is written, and the file name under which it is stored on a disk.

```
1 REM ** Scramble an Array of Numbers, 1 to n **
2 ' Your BASIC Backpack #15  8/29/1988
3 ' Microsoft GW-BASIC  File: YBB1501G.BAS
```



The file name tells us this program is from Your BASIC Backpack #15 (YBB15), is the first program (01), and is written in GW-BASIC (G). The extension (.BAS) appears on all GW-BASIC or QuickBASIC programs.

Block 100 has two new things: DEFINT and DIM.




```
100 REM ** Set up **
110 SCREEN 0: CLS: KEY OFF: WIDTH 80
120 RANDOMIZE TIMER
130 DEFINT a - z        ' Define all variables as integers
140 DIM array(1000)     ' Dimension array up to 1001 elements
```

The statement: DEFINT a - z

Tells the computer to regard all variables as integer variables. Many professional programmers do this in all their programs. Then, if they want to use a single precision variable, they override the DEFINT by attaching an exclamation point (!) to the right end of the variable name (for example, pi! or meters! or TaxRate!). Likewise for double precision variables (BigMoney#, LotsaBucks#, NationalDebt#).

The statement: DIM array(1000)

Tells the computer to reserve room in memory for 1001 subscripted variables: array(0), array(1), array(2), and so on, up to array(1000). REMEMBER, because of DEFINT, these are integer subscripted variables, each requiring two bytes of memory. The keyword DIM is an abbreviation for DIMension.

Block 200 is simple. It asks for the number of array elements to generate. If you want 7 numbers, type 7 and press ENTER; if you want 52 array elements, type 52 and press ENTER; and so on.

```
200 REM ** Get number of array elements to generate **
210 CLS: INPUT "How many numbers"; NumberOfElements
```

Block 300 tells the computer to assign 1 as the value of array(1), 2 as the value of array(2), and so on -- up to the number of elements you told it to assign in Block 200 (NumberOfElements). Note that array(0) is not used in this program.

```
300 REM ** Generate the original (unscrambled) array **
310 FOR index = 1 TO NumberOfElements
320   array(index) = index
330 NEXT index
```

After Block 300 has done its thing, numbers are stored in the array called array, as follows:

array(1) [1] array(2) [2] array(3) [3] and so on ...

up to array(NumberOfElements) [value of NumberOfElements]

Block 400 verifies that everything is AOK by printing the entire array.

```
400 REM ** Print the original (unscrambled) array **
410 PRINT
420 PRINT "Here are the original (unscrambled) numbers:"
430 PRINT
440 FOR index = 1 TO NumberOfElements
450   PRINT array(index),
460 NEXT index
470 PRINT
```

Next, the heart of the program. Block 500 scrambles the array. It swaps the number in array(1) with a random array element, then swaps the value of array(2) with a randomly selected array element, and so on down to the very last subscripted variable, which is array(NumberOfElements).

```
500 REM ** Scramble the array **
510 FOR index = 1 TO NumberOfElements
520   RandomIndex = INT(NumberOfElements * RND) + 1
530   SWAP array(index), array(RandomIndex)
540 NEXT index
```

And here are your scrambled numbers, courtesy of Block 600.

```
600 REM ** Print the scrambled array **
610 PRINT
620 PRINT "Here are your mixed-up numbers:"
630 PRINT
640 FOR index = 1 TO NumberOfElements
650   PRINT array(index),
660 NEXT index
670 PRINT
```

Well, that's almost it. One more thing: Tell how to do again, as in Block 700 below.

```
700 REM ** Tell how to do again **
710 PRINT: PRINT "To do again, press any key"
720 anykey$ = INPUT$(1): GOTO 210
```

VARIATIONS: If you want to pack more numbers on the screen, change lines 450 and 650, as follows:

```
450   PRINT USING "#####"; array(index);

650   PRINT USING "#####"; array(index);
```

Want to print to your printer instead of to the screen? Easy -- in Blocks 400 and 600, change every PRINT to LPRINT.

YOUR TURN. Use Blocks 1 thru 600 of our program and try to do the following things, beginning with your Block 700. Move our Block 700 to the end of your program and renumber it.

continued on page 320

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BASIC Backpack continued from page 318

- Find and print the index of the smallest number in the array. The smallest number, of course, is one. But where is it? Is it in array(1) or array(2) or array(3) or ... and so on. Write Block 700 to find and report on the index, or subscript, or location within the array, of the smallest element. You can easily verify that your Block 700 is working correctly by looking at the printout of the entire scrambled array and counting over to the number 1.

- Find and print the index of the largest number in the array.

- Ask for a number and tell whether the number is or isn't in the array. If it is in the array, tell where -- give the index.

- SWAP the number in array(1) with the smallest number in the array, then print the current status of the array -- after the SWAP.

Yes, if you do the above, you have begun the first steps toward understanding some of the power tools of information management.

BASIC is the **Swiss Army knife** for computer-using people.

The Return of Zappy Artist

Zappy really appreciates the many letters that said, "Don't zap Zappy." Zappy apologizes for being array for awhile and hopes that his absence has not caused anything to go awry. On his way out, he mumbled something about boxes with indexes, subverted variables, and a bunch of other incomprehensible stuff. Well, hopefully, he'll visit again soon and elucidate.

Oh, here's a note from Zappy. He says, "I've found a new way to store stuff by using numbered boxes. Tell you about it as soon as I understand it. In the meantime, I'd like to introduce my friend, Wandering Star."

Wandering Star wanders about the universe, looking for her favorite food, cosmic dust. When she finds a cosmic oasis full of cosmic dust, she wanders about it, this way, that way, in all directions, scarfing up any cosmic dust motes she finds. Oddly enough, a cosmic oasis looks much like the screen of your computer. Cosmic dust looks like dots (.) scattered about the screen (oops! cosmic oasis). Wandering Star pops into the oasis near the center of the screen -- er, oasis, and rests for a brief time. Hyperspace travel is very tiring!

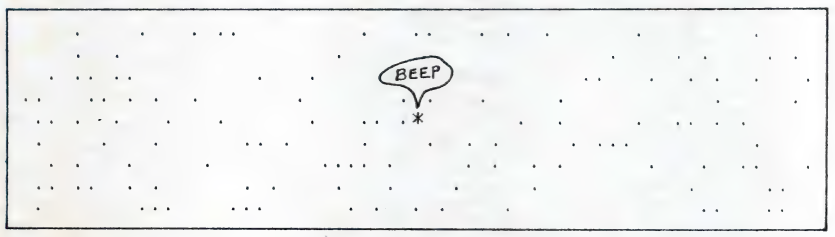
After her brief rest, Wandering Star wanders -- right, left, up, down -- looking for cosmic dust. If she meanders into a place that contains a cosmic dust mote, she eats it, then moves on.

Eventually, Wandering Star may reach the edge of the cosmic oasis and disappear. This usually happens long before she has eaten all the cosmic dust. When this happens, a mysterious message appears:

Illegal function call in 640

What do we do about this? How can we help Wandering Star? Only kids know how to help. If you are a kid, please send suggestions to Wandering Star, P.O. Box 1635, Sebastopol, CA 95473.

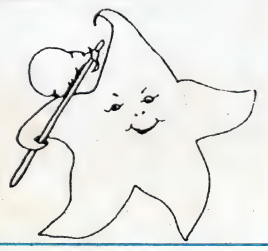
Enter the program and run it. Cosmic dust appears in many colors on a black screen (Block 200). Wandering Star appears near the center of the screen at row 12, column 39 (Block 300) and rests for a few cosmic seconds (Block 400). The number of seconds is selected randomly, 1 to 10. Wandering Star is represented by an asterisk (*) in blinking light magenta (COLOR 29). Block 500 computes a new screen location for Wandering Star, chosen at random from four possibilities. Finally, in Block 600, Wandering Star moves to the new location. This is done by printing a space in her old location (line 610), then setting her coordinates to the new location (line 620), then printing her in the new location (lines 620 to 650). She beeps, dallies a tiny bit, and goes to wander some more (Block 700).




```
1 REM ** Zappy Artist Introduces Wandering Star **
2 ' Your BASIC Backpack #15  8/29/1988
3 ' Microsoft GW-BASIC  File: YBB1502G.BAS

100 REM ** Set up **
110 SCREEN 0: CLS: KEY OFF: WIDTH 80
120 RANDOMIZE TIMER
130 DEFINT a - z      'Define all variables as integer

200 REM ** Cosmic oasis with cosmic dust motes (.) **
210 CLS
220 dust$ = "."
230 FOR mote = 1 TO 500
240   row = INT(25 * RND) + 1
250   col = INT(80 * RND) + 1
260   COLOR INT(15 * RND) + 1
270   LOCATE row, col: PRINT dust$;
280 NEXT mote
```



```
300 REM ** Wandering Star appears **
310 WanderingStar$ = "*"
320 row = 13: col = 39                  'Near the center of the screen
330 NewRow = row: NewCol = col          'Used in Block 500
340 COLOR 29                            'Blinking light magenta
350 LOCATE row, col, 0                  'Zero turns off cursor
360 PRINT WanderingStar$;               'Here she is!

400 REM ** Wandering Star rests for a little while **
410 RestTime = INT(10 * RND) + 1        '1 to 10 cosmic seconds
420 StartTime! = TIMER                  '! is single precision
430 IF TIMER < StartTime! + RestTime THEN 430

500 REM ** Which way? Right, up, left, down? **
510 WhichWay = INT(4 * RND) + 1
520 IF WhichWay = 1 THEN NewCol = col + 1   'Right
530 IF WhichWay = 2 THEN NewRow = row - 1   'Up
540 IF WhichWay = 3 THEN NewCol = col - 1   'Left
550 IF WhichWay = 4 THEN NewRow = row + 1   'Down
```

```
600 REM ** Wandering Star wanders **
610 LOCATE row, col: PRINT " ";         'Erase from old place
620 row = NewRow: col = NewCol          'Set up the move
630 COLOR 29                            'Blinking magenta
640 LOCATE row, col, 0                  'Zero turns off cursor
650 PRINT WanderingStar$;               'Move her to new place
660 BEEP                                'She loves to beep

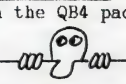
700 REM ** Delay, then wander some more **
710 StartTime! = TIMER
720 IF TIMER < StartTime! + .5 THEN 720 ELSE 510
```

Teach Yourself QuickBASIC

This section began in Your BASIC Backpack #8, April 1988. So we now assume that you are acquainted with several of QB's windows, menus, and operating procedures. We have used the following QuickBASIC **keywords:**

BEEP	IF...THEN	LOCATE	TIME$
CLS	INKEY$	PRINT	UCASE$
COLOR	INT	PRINT USING	UNTIL
DATE$	INPUT	REM	WHILE
DO...LOOP	INPUT$	RND	WIDTH
END	LCASE$	SCREEN	
EXIT	LINE INPUT	SOUND	

Read about these keywords in the Microsoft QuickBASIC 4.0 BASIC Language Reference, which comes in the QB4 package.



By the time you read this, you may have heard of a new development in the QuickBASIC world, of special interest to novices. If it hasn't yet happened, watch for it -- or send a self-addressed, stamped envelope to Your BASIC Backpack, P.O. Box 1635, Sebastopol, CA 95473, and we will tell you about it as soon as our non-disclosure agreement permits. In the meantime, here are more QB versions of GW-BASIC programs from previous episodes of YBB.

QuickBASIC Can Run GW-BASIC Programs

QuickBASIC can run most GW-BASIC (and BASICA) programs. To do so, save the GW-BASIC program in ASCII format. For example, while using GW-BASIC in the Teach Yourself BASIC section this time, you could save program YBB1501G to disk drive A, in ASCII format, like this:

Type **SAVE "YBB1501G", A** and press ENTER.

Of course, you can save a little time by pressing the F4 function key -- the computer will type SAVE" and you type the rest. If you want to save to disk drive B in ASCII format, do it as follows:

Type **SAVE "B:YBB1501G", A** and press ENTER.

Now remove GW-BASIC and install QuickBASIC. Use the Open Program choice in the File Menu and load YBB1501G into the View Window. Then use the Run Menu to run the program. Don't be surprised if the program runs much faster in QB than it did in GW!

Actually, in writing the Teach Yourself BASIC section of YBB, we use QuickBASIC to develop our GW-BASIC programs -- it's lots easier! The QB editor is excellent and doesn't change our lower case or mixed case variables to all upper case. It also changes keywords to all upper case and finds our syntax errors as soon as we try to leave the line where we goofed. We save our programs in ASCII format by using the text choice in the Save As... dialog box so we can load them in GW-BASIC for a final check.

For a novice computer user, there is an added bonus. While learning QuickBASIC, you can also learn word processing as a by-product, plus a lot about using files and file managers, windows, and probably other stuff we didn't think about.

Future Value of Money -- Compound Interest

After the great crash of '87, perhaps you moved what was left of your nest egg to a nice safe place like Erosion Savings & Loan, where it simultaneously slowly grows via compound interest while its purchasing power slowly erodes due to inflation. Here is the QB version of the GW-BASIC program that appeared in YBB #8, April 1988. First, a REM outline of the program.

```
REM ** Future Value of Money -- Compound Interest **

REM ** Print the date and time **

REM ** DO...LOOP to get data, compute & print future value **
  ' Get principal, interest rate, number of periods
  ' Compute and print future value of investment
```

continued on page 324

A PRACTICAL GUIDE TO MAIL ORDER SHOPPING IN *COMPUTER SHOPPER*

Shopping by mail order in *Computer Shopper* has many advantages. There are hundreds of companies offering thousands of bargains on computer products. Mail order shopping is convenient, economical and growing more popular with business buyers each year. As a mail order shopper there are guidelines you should follow when you prepare to make a successful purchase.

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What is the Seller's return policy?

What is the Seller's refund policy?

With whom should you correspond if there is a problem?

THE LAW ON MAIL ORDER

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6. In the event that the item you ordered is unavailable, the Seller may not send you substitute merchandise without your express consent.

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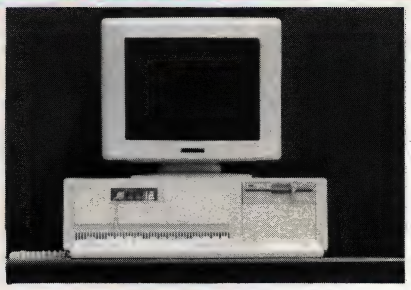

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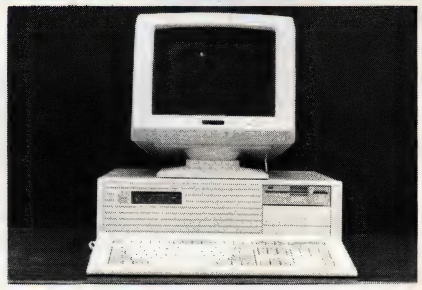

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BASIC Backpack continued from page 320

The REM outline lays out the overall structure of the program. Next, let's see how we want the screen to look during a run.

```
The date is 08-29-1988
The time is 13:05:27

Principal (enter 0 to quit) ? 1000
Interest rate per period    ? .5
Number of interest periods  ? 12

At maturity, the value will be                $x,xxx.xx

Principal (enter 0 to quit) ? 0


Press any key to continue
```

Once the REM outline and screen design are done, it's easy to write the program. Note that the program is designed to hand big money, lotsa bucks. It uses three kinds of variables:

Single precision variables:	RatePerPeriod!	Rate!
Long integer variable:	NumberOfPeriods&	
Double precision variable:	Principal#	

DATE$ and TIME$ are QuickBASIC keywords and are also string variables.

The PRINT USING statement prints a dollar sign in front of the number, inserts commas in the right places, and rounds the number to the nearest cent.

Well, finally, here is the program.

```
REM ** Future Value of Money -- Compound Interest **
' Your BASIC Backpack #15  8/29/1988
' Microsoft QuickBASIC 4.0  File: YBB1503Q.BAS

REM ** Print the date and time **

CLS
PRINT "The date is "; DATE$
PRINT "The time is "; TIME$
PRINT

REM ** DO...LOOP to get data, compute & print future value **

DO

  ' Get principal, interest rate, number of periods
  INPUT "Principal (enter 0 to quit) "; Principal#
  IF Principal# = 0 THEN EXIT DO
  INPUT "Interest rate per period    "; RatePerPeriod!
  INPUT "Number of interest periods  "; NumberOfPeriods&
  PRINT

  ' Compute & print future value of investment **
  Rate! = RatePerPeriod! / 100
  FutureValue# = Principal# * (1 + Rate!) ^ NumberOfPeriods&
  PRINT "At maturity, the value will be ";
  PRINT USING "$$############,.##"; FutureValue#
  PRINT

LOOP
```

How long to double $1000 at .5% per month (6% per year)?

```
The date is 08-31-1988
The time is 07:08:33

Principal (enter 0 to quit) ? 1000
Interest rate per period    ? .5
Number of interest periods  ? 120

At maturity, the value will be          $1,819.40

Principal (enter 0 to quit) ? 1000
Interest rate per period    ? .5
Number of interest periods  ? 180

At maturity, the value will be          $2,454.09

Principal (enter 0 to quit) ? _
```

Looks like sometime between 10 years (120 months) and 15 years (180 months). You can use the program to pin it down more precisely. Enter zero (0) to quit, or just press ENTER without typing a number.

Roll 2D6 (two six-sided dice)

Millions of kids who play role playing games know that 2D6 is an abbreviation for **two six-sided dice**. This is also known to a few older people who are tuned in to this subculture. If we forget to bring our dice to a game, we simply reach into our backpack, pull out our laptop computer, and simulate the dice we need. Here is a QB version of our dice roll simulation which appeared as a GW-BASIC program in YBB #7, March 1988.

```
REM ** Roll 2D6 (two six-sided dice) **
' Your BASIC Backpack #15  8/31/1988
' Microsoft QuickBASIC 4.0.  File: YBB1504Q.BAS

REM ** Define random integer function, FNrndint%(n%) **
' Returns an integer 1 to n%, equally probable
DEF FNrndint% (n%) = INT(n% * RND) + 1

REM ** Set up **
CLS
RANDOMIZE TIMER

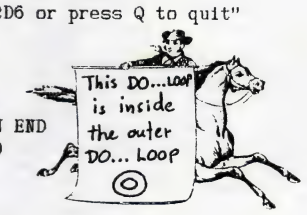
REM ** DO...LOOP: Press space to roll 2D6 or press q to quit **

DO

  ' Tell what to do
  PRINT "Press SPACEBAR to roll 2D6 or press Q to quit"

  ' Wait for space or letter Q
  DO
    BEEP: anykey$ = INPUT$(1)
    IF UCASE$(anykey$) = "Q" THEN END
    IF anykey$ = " " THEN EXIT DO
  LOOP

  ' Compute and print the roll
  PRINT "The roll is"; FNrndint%(6) + FNrndint%(6)
  PRINT
LOOP
```



Run the program. Press the space bar to make a roll or press q to quit.

```
Press SPACEBAR to roll 2D6 or press Q to quit
The roll is 9

Press SPACEBAR to roll 2D6 or press Q to quit
The roll is 4

Press SPACEBAR to roll 2D6 or press Q to quit
The roll is 10

Press SPACEBAR to roll 2D6 or press Q to quit
.
.

Press any key to continue
```

2D6

Make a REM File to Keep Track of Programs

In 15 episodes of YBB, we have collected quite a bunch of programs. Let's see now, where was that program to make anagrams? So we have decided to get organized. We'll do it by making a program consisting only of REM statements containing information about programs that appeared in YBB. Of course, we'll also use the apostrophe (') as an abbreviation for REM. In fact, we will go back over all previous issues and rename program files according to the convention introduced this time. Our REM file might begin like this:

```
REM ** Your BASIC Backpack REM File, Programs & File Names **
' Your BASIC Backpack #0  8/31/1988
' Microsoft GW-BASIC or QuickBASIC  File: YBB0000A.BAS
' ASCII format -- list but don't run in GW-BASIC

' Bob Albrecht & Don Inman, POB 1635, Sebastopol CA 95473
' YBB is in COMPUTER SHOPPER, POB F, Titusville FL 32781

REM ** YBB #1, COMPUTER SHOPPER Sep '87 **
' YBB0101G.BAS  Negative, Zero, or Positive #1
' YBB0102G.BAS  Negative, Zero, or Positive #2
' YBB0103G.BAS  Negative, Zero, or Positive #3

REM ** YBB #2, COMPUTER SHOPPER Oct '87 **
' YBB0201G.BAS  Negative, Zero, or Positive #4
' YBB0202G.BAS  Negative, Zero, or Positive #5
' YBB0203Q.BAS  Negative, Zero, or Positive #6
' YBB0204G.BAS  String Squeezer Test Program
' YBB0205Q.BAS  String Squeezer Test Program

REM ** YBB #3, COMPUTER SHOPPER Nov '87 **
' YBB0301G.BAS  Dollars and Cents
' YBB0302Q.BAS  Dollars and Cents
' YBB0303G.BAS  Negative, Zero, or Positive #7
' YBB0304Q.BAS  Negative, Zero, or Positive #8
' YBB0305Q.BAS  Leap Year or Common Year
' YBB0306G.BAS  Word Maker

REM ** YBB #4, COMPUTER SHOPPER Dec '87 **
' YBB0401Q.BAS  Maximum and Minimum of Two Numbers
' YBB0402G.BAS  Negative, Zero, and Positive #9
' YBB0403Q.BAS  Negative, Zero, and Positive #10
' YBB0404T.BAS  UPSQUEEZE, downsqueeze -- Ed Ayre
' YBB0405T.BAS  English Name of a Decimal Digit -- Ed Ayre

' To be continued
```

In the spirit of getting organized, we will go back over all of YBB and put all programs on one disk, including this program (YBB0000A.BAS). Then, whenever we want to know something about a program, we will load and read, but not run, the above program. Since this program is saved as an ASCII program (Text option in QB), we can load it and read it in GW-BASIC or QuickBASIC. We can also TYPE or PRINT it in MS-DOS or in Microsoft Works or Tandy Deskmate or PC-Write or ...

Is anyone interested in a copy of the disk containing all (well, almost all) programs that have appeared in Your BASIC Backpack?

Solution Hints

This time we'd like to provide some hints on how to solve previously posed problems and encourage you to write the programs, in good style, of course.

continued on page 580

DOS Help!
continued from page 318

mand needed at the moment. DOS Help! satisfies both these latter requirements.

Features

Once you load DOS Help! into your computer, it can be made memory-resident, available to pop into use at the touch of a hot-key combination. It can occupy a full screen, or the upper or lower half in case you want to view your application program at the same time.

The full syntax of all DOS commands, up to and including DOS 3.3, is shown. Each command is explained in plain language—what it does and how to use it. There are nearly 300 screens filled with useful information, including hundreds of tips and hints on how to get the most out of DOS.

A Subject Index, a Command Index, a Glossary, and Command Summaries make it easy to find the help you need. You can select your favorite screen colors, print pages to the printer, and have automatic lookup of commands and topics as you run across them in the text.

DOS Help! also provides and explains the things you might have trouble finding elsewhere: ASCII chart, DEBUG and EDLIN commands, the CONFIG.SYS and AUTOEXEC.BAT files, Input/Output redirection, paths, directories and more.

Of particular interest to beginners is the Beginner Command Subset that covers just the most common and useful DOS commands. For experts, all the hard-to-remember and seldom used commands and options are shown, including advanced batch command language and CONFIG.SYS directives.

Using DOS Help!

As of this writing, the latest version of DOS Help! is 3.3a, which contains a number of features not included in Version 3.2 or 3.3. This version, for example, includes all the DOS 3.3 commands and a more detailed discussion of batch files and specifically the DOS 3.3 batch commands. Also, of particular importance to beginners, the Beginners Command Subset of the most commonly used DOS commands has been added.

DOS Help! is about as close to an instructionless program as you can get. In fact, the printed documentation is only one sheet! If you don't have a hard drive, all you need to do is boot up, place the DOS Help! diskette in Drive A, type HELP and press the Enter key.

If you boot up on a hard drive, first type A: and press Enter before typing HELP. This will make A the default drive so it will read the DOS Help! diskette.

Press any key to get past the second screen. The Main Menu appears. Now press F1 for an instant display which shows the actions of the function keys. Press any key for another help screen showing the actions of the cursor, Escape and other keys for topic help and paging. Press any key again and a screen will tell you how to make DOS Help! RAM-resident (in memory for pop-up anytime), and three different ways to pop up DOS Help! while in another program.

Press any key and you're back at the Main Menu (or wherever you were when you hit F1.) If you're using DOS Help! for the first time, and you have a color monitor, press F7 to set colors as shown on the color selection screen. You can have 8 or 16 colors for the background, border, text & frame, menu items, cursor and cursor foreground. As you make the changes they are shown in the sample panel on

continued on page 322

```
DOS Help! 3.3a ═══════════ F1 Help F10 Exit
                Beginner Command Set
Most DOS commands are used rarely or not at all.  When you are just starting
out with DOS, focus on the following DOS commands:

Dir ......... Display a list of files on a disk or hard disk directory
Type ........ Display the contents of the file on your screen.  Use
              Ctrl-NumLock (or the Pause key) to halt the scrolling.

Copy ........ Clone a file — copy it to a different disk, or make a backup
              with a new name (in case the original gets messed up or lost)
Rename ...... Change the name of a file
Erase ....... Get rid of an old, unwanted file.  Note: Use caution.

Diskcopy .... Clone an entire diskette
Format A: ... Prepare a new-from-the-box diskette before using it

Ver ......... Find out which version of DOS is running

 Hard Disk Commands   If you have a hard disk, you will need to become
                      acquainted with the commands that help you keep track
of large amounts of data.  Read up on the following commands and topics:
More ═══════════
```

Figure 3—Beginner Command Set (portion).

Software Breakthrough: the RANDOM information processor

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Ask Dr. John
continued from page 316

ucts will let you run Apple II or Mac programs. All they can do is read Apple II data diskettes and Macintosh data diskettes.

Q. I have an IBM PC that was orginally a two floppy drive system. I have since added a 30MB hard drive, a modem and a memory expansion board (640K). In doing this I have used all five of my internal expansion slots (the other two slots hold my printer interface and my floppy controller).

I would like to add a tape drive and an EMS board, but have no place to "plug them in." What options do I have (if any). Am I stuck with no way to expand or can I get another chassis with eight or more slots?

S. H.

A. You are sitting face to face with the primary reason that IBM went to 8-slots when they introduced the XT. Five slots does make for a tight system. You do have several options however, and I'm not sure that an expansion chassis is your best bet.

First, let's look at the boards you have in your system. If I understand you correctly, the five boards in your system are:

1) display card with a parallel port
2) hard disk controller board
3) floppy controller board
4) memory expansion board
5) modem board

If this is correct, I'd suggest that you look into obtaining a multi-function board of some sort before you lay out the several hundred dollars that an expansion chassis will cost you. There are boards that combine floppy and hard controllers as well as boards that have memory expansion up to and through the megabyte range.

Additionally, there are one or two companies producing tape drives that do not require a special tape controller board—they use one of the floppy ports. Although I hesitate to recommend any one manufacturer for these products since there are so many folks around producing them; to help get you started I'd recommend that you contact AST (they've been producing multi-function boards for quite a while) and/or Everex (they also produce multi-function boards). And for the tape drive, talk to Archive. These guys make quite a few different tape drives (some of which work off of a floppy drive controller) and I think that one of them will probably solve your problem easily.

If you do decide to spend the money and buy an expansion chassis, I'd suggest that you get one that has room for at least a couple of drives along with the board slots and includes a separate power supply. While you may not be thinking about extra drives right now, let me tell you that there are some interesting products on the horizon that you may want to plug into your computer in the future. For example, one manufacturer has suggested that they will be marketing an internal CD-ROM drive with 500 million byte (and more) capacities!

Q. I purchased a PC Transportable (model 5140 six months ago assuming that its compact size and mobility would make it better for my purposes than a desktop unit. However, since entering graduate professional school, I've been running into some diskette compatibility problem. All of the classroom work and student group projects require 5¼" floppy diskettes and my computer uses only 3½" diskettes.

While I can use transfer software such as Lap-Link to transfer the data between my computer and an AT or XT type computer, I am finding it difficult to constantly find an available desktop computer each time an assignment is due.

Is there a way that I can attach a 5¼" disk drive to my transportable?

R. L.

A. Yes, you can attach a 5¼" drive to your transportable. If your unit has an external floppy disk connector, all you need to do is purchase an external drive from any of the many companies that produce them for their own portables such as NEC or Toshiba.

If you do not have an external floppy drive connector on the back of your unit then you can either obtain the (now obsolete) IBM adapter board if you can find one or run cables to your existing internal drive B (if you feel comfortable with doing minor electronic modifications yourself).

If you are interested in making the modifications, here is one approach that would work:

First, open the case and replace the

continued on page 327

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DOS Help!
continued from page 325

the right side of the screen. This is really neat, and very easy to use. You can then make the changes temporary or permanent. For a monochrome screen, no changes are necessary, since high brightness and reverse video are used very effectively.

If you happen to have both a monochrome and CGA board in your PC, as I do, the program defaults to monochrome. To get color, you'll need to type MODE CO80 and press Enter while in DOS, with the DOS file MODE.COM on your default drive.

Back at the Main Menu, you can select help for any of the categories shown. You may want to select "How to use DOS Help!" for instructions on how to install DOS Help! on your hard disk, if you have one.

The Main Menu gives you nine choices. For example, if you select DOS Commands, you'll get the screen shown in Figure 1 on page 318, and DOS Command Groups gets you the screen shown in Figure 2 on page 318. Use the cursor keys to highlight the topic you want, press Enter, and the text describing the selected subject will appear relatively jargon-free in one or more screens. Even with a plain-vanilla floppy-disk 4.77MHz IBM PC/XT, the screens appear almost instantly.

Figure 3 on page 325 shows a portion of the text in the Beginners Command Set. You can scroll up and down the text explanations by the line or the page. Just highlight any of the command words and press Enter and you are immediately transported to a detailed explanation of that command, its use and its syntax. Anytime you want to get back to your last selection, press the Escape key.

You can play with the program until its use becomes obvious. All operations are controlled with the cursor keys, Enter key and Escape key. Use either F9 to quit with the last Help! screen remaining, or F10 with a clear screen. Don't worry about making mistakes. DOS Help! is bulletproof; there is nothing you can do to hurt the program or your computer.

I found no surprises when using DOS Help! other than its speed and extensive coverage. Although I have other memory-resident programs, DOS Help! did not seem to interfere with anything else even when I made it memory-resident. It operated smoothly and intuitively, and (despite a good familiarity with DOS) I discovered new things about DOS just while browsing through screens. It's really a very non-threatening method of learning about DOS. My only disappointment was when I could not find a definition of

continued on page 328

Ask Dr. John
continued from page 326

existing data cable (34-conductor cable) that goes to the back of the two internal floppies with a longer cable. This cable will need to have the same kinds of connectors (34-headers) as the old cable did, and in roughly the same locations. The difference is that the new cable continues on and extends another 24 inches or so and has a standard edge-card type connector at the end.

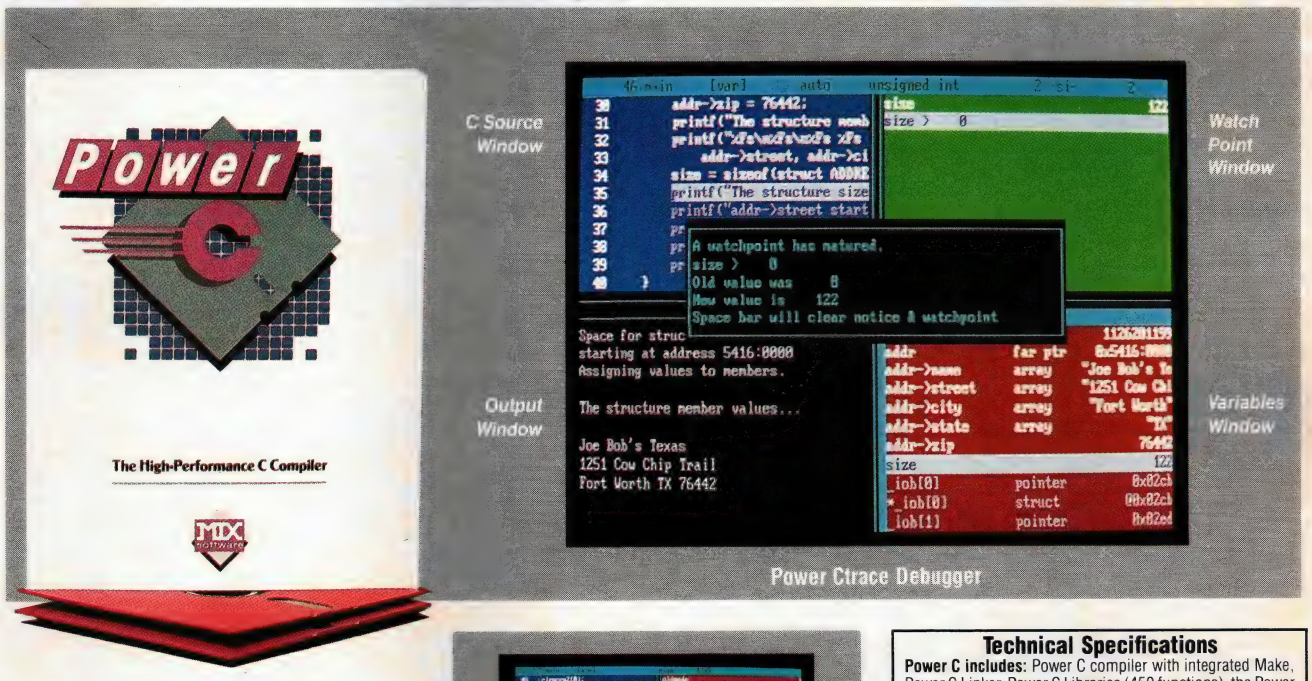
Second, you'll need to run a third power connector out the back of the computer. This will have to have one of the larger Molex-type 5¼" 4-pin power connectors. Be sure that you put +5, +12 and the two ground lines in the proper places. They're marked on the back of the internal drives in most units. If they are not marked, use a voltmeter or multimeter to confirm that you have the right wires. The 5¼" connector needs to be wired as folows:

+5	GND	GND	+12
()	()	()	()

Once you have these connections, you could, in theory just plug in any standard 5¼" drive and go. However, you'd need to disconnect the internal B: drive. As an alternative, I'd suggest wiring up a DPDT switch that runs to the internal B: drive's drive select line. Remove the jumper that is connected to D0 and connect a 2-pin 0.010 Molex (or similar) connector. Wire this up to the DPDT microswitch at the back of the computer and put a similar connector on the D0 pins of the 5¼" drive. Then, for portable operation, using the internal drive as B: just flip the switch to the proper position. And when you want to run the external drive as B:, flip the switch the other way.

Got a question about computers? Send your letters to John Heilborn, Ask Dr. John, P.O. Box 20102 Castro Valley, CA 94546 or send electronic mail to Compuserve at: 70007,3406. ●

How to create high-performance programs without wasting your time or money



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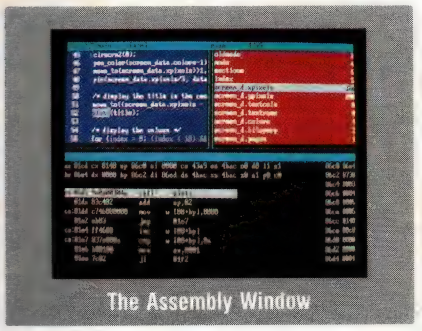
2) sieve	27.6	43.2	25.5
3) tdbl	3.5	9.0	9.6
4) diskio	13.5	14.4	14.3
5) report	11.0	71.7	60.7
6) drystone	36.6	41.6	31.8
Compile/Link	73.9	113.5	81.4
EXE File Size	25120	32092	27184
Compiler Price	$19.95	$99.00	$99.95
Debugger Price	$19.95	N/C	N/A
Library Source	$10.00	$150.00	$150.00
Total Cost	$49.90	$249.00	$249.95

N/C no charge - N/A not available
Benchmarks compiled using Make utility, command-line compiler, and medium memory model



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The Unspreadsheet For MSDOS—Version 3.0

by Fred Blechman

It is said that many things improve with time. This is certainly true with The Unspreadsheet, an unconventional worksheet that combines text and calculations with a natural language interface. Furthermore, I'm pleased to say, you can still use this program on a single 360K floppy disk with most MSDOS machines.

Formerly called It Figures, but now called The UnSpreadsheet with Version 3.0 (released March 20, 1988), this program is designed to efficiently do linear problem solving, "what-ifs," and repetitive analysis. It displays a preformatted electronic worksheet one screen at a time, and screens can be "chained" for larger applications. The UnSpreadsheet is easy to use, fast in operation, and extremely versatile. Through a special arrangement with the producer, *Computer Shopper* readers can get The Unspreadsheet for only $10 instead of the regular $49.95 price!

As a major plus, The UnSpreadsheet can be installed to operate with PCs that have odd screen requirements, such as the Sanyo MBC 550/555 series or the Tandy 2000.

Background

I first became acquainted with It Figures, as it was originally called, when it was released in early 1986. It worked fine with my Sanyo MBC 555-2 in both color and monochrome, unlike most IBM PC spreadsheets. That was Version 1.0, which included templates (preset formulas and text) for 40 applications. The suggested retail price was $39.95, but the flyer I received offered it for $29.95. I found it useful even though it lacked some features I would have liked.

This was followed with newer versions that had more features and more templates, for a small upgrade fee ($5 or $10) to registered users.

The original manual was a 71-page staple-bound booklet printed from reduced computer-printed pages. The latest manual is typeset, perfect-bound, and has 92 pages. Version 1.2 had 50 templates, Version 2.0 had 75 templates, and Version 2.01 had 85 templates. The suggested retail price moved up to $49.95.

I got the original It Figures and liked it so much I paid the small update charge for the revisions, although I never actually used any version past 1.2. I was not aware of any version later than 2.01, so I was surprised while at a recent computer show to find a brand new version, 3.0, and now called The

continued on page 568

DOS Help!
continued from page 327

syntax within DOS Help!—and I know what that is anyhow.

More Help!

In addition to DOS Help!, Flambeaux Software offers TECH Help!, a combined electronic version of over $500 worth of technical reference manuals used by system-level programmers on the IBM PC/XT/AT, PS/2 and compatibles. It sells for $89.95. Also, you can make your own electronic Help! manuals with the Help! Development Kit for $45. Contact Flambeaux for detailed information.

Incidentally, but not inconsequentially, DOS Help! was written by Dan Rollins, award-winning author of the Norton Online Guide to OS/2, and IBM PC:8088 MACRO Assembler Programming.

DOS Help!
Flambeaux Software
1147 East Broadway, Suite 56
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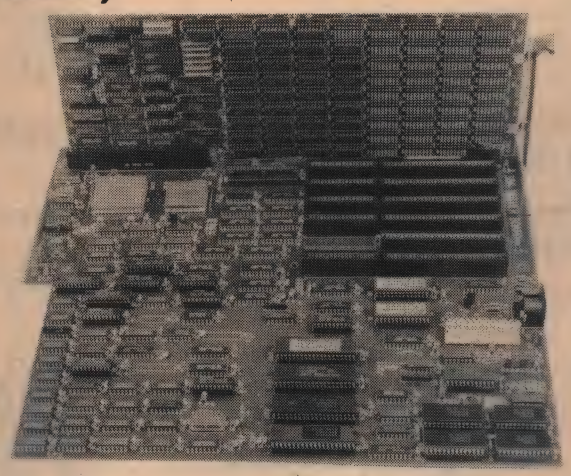

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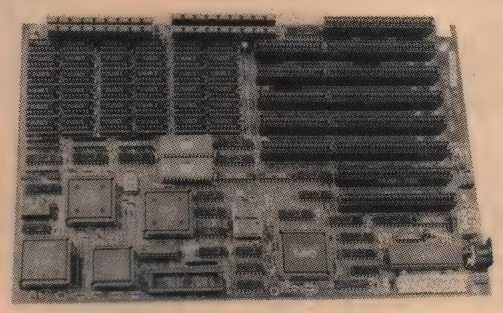

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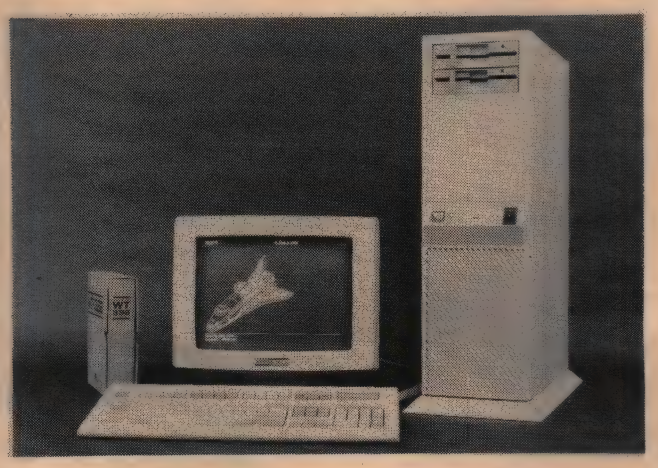

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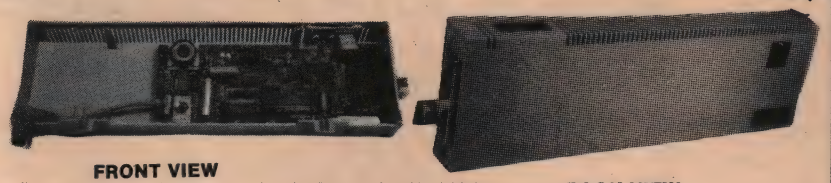

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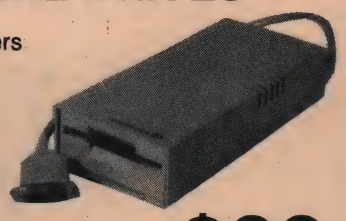

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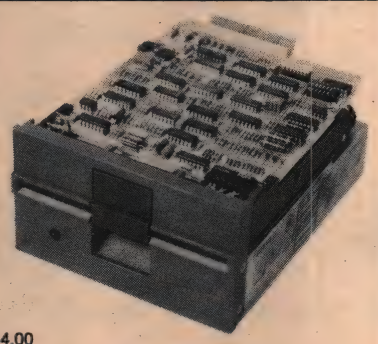

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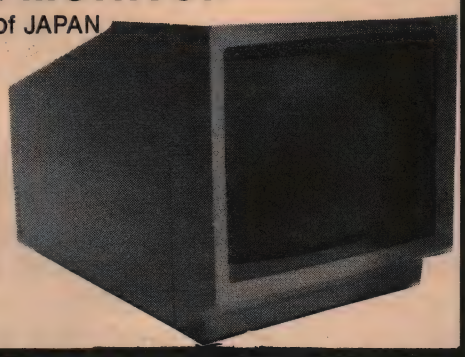

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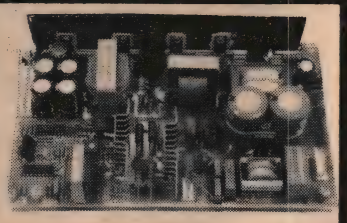

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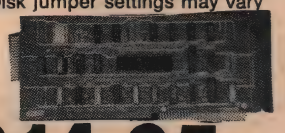

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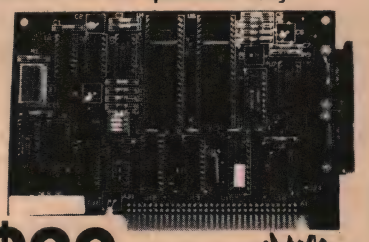

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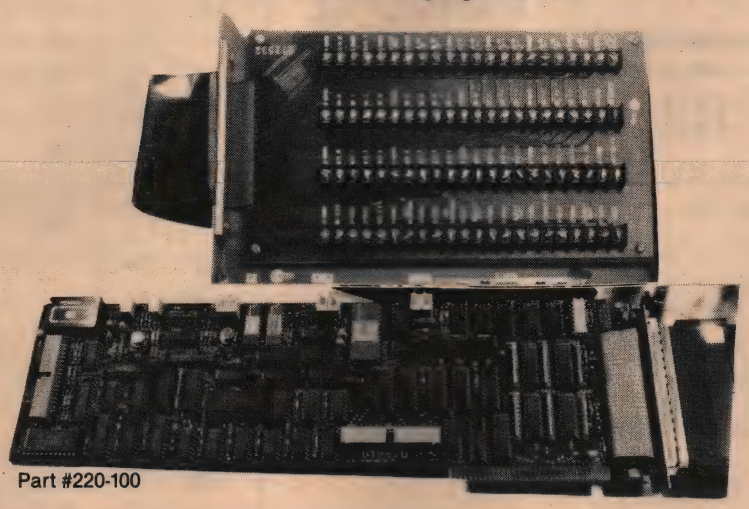

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ANALOG INPUT: The analog input functions of the adapter operate in eigher programed or interrupting mode. The analog input functions provide 12-bit relative accuracy.

RESOLUTION - 12 bits
INPUT CHANNELS- four differential

INPUT MODES-	unipolar or bipolr, user-selectable
INPUT RANGES:	
unipolar	0 TO ±10 volts, user-selectable
bipolar	±5 and ±10 volts user-selectable
OUTPUT MODE:	
unipolar	straight binary
bipolar	offset binary
INPUT IMPEDANCE	>100 megohms with 100 picofarads
INPUT CURRENT	limited to less than ±4 mA
INPUT VOLTAGE:	
Normal mode	±30 volts maximum, without damage, power on or power off
Common mode	±11 volts maximum
COMMON MODE	
Rejection ratio	72 db
Integral linearity error	±1 LSB maximum
DIFFERENTIAL Linearity	
Error	± ½ LSB maximum
Stability	±5 ppm/degrees C of FSR (max)
GAIN:	
Error	±0.1% between ranges (max) any range adjustable to 0
Stability	±32 ppm/degrees C of FSR (max)
OFFSET:	
Error	adjustable to 0
Unipolar stability	±24 ppm/degrees C of FSR (max)
Bipolar stability	±24 ppm/degrees C of FSR (max)
MONOTONICIITY	0 to 50 degrees C
THROUGHPUT to memory	15,000 conversions/second min.

The analog output functions of the adapter operate in programed I/O mode. The analog output functions provide 12-bit relative accuracy.

RESOLUTION	12-bits
Number of output channels	2
OUTPUT modes	unipolar or bipolar, user-selectable
OUTPUT ranges:	
Unipolar	0 to ±10 volts, user-selectable
Bipolar	±5 and ± +10 volts, user-selectable
INPUT CODE:	
Unipolar	straight binary
Bipolar	offset binary
OUTPUT Current	+5 milliamps, min. with normal loading and protection from damage with the output shorted to common.
OUTPUT Impedance	2 ohm, max.
CAPACITIVE loading	0.5 microfarads, max.
GAIN:	
Error	0.1 betweem ranges (max.), any range adjustable to 0
Stability	± ppm/degrees C of FSR(max)
OFFSET:	
Error unipolar	±3.25 millivolt max.
Error bipolar	adjustable to 0
Unipolar stability	±8 ppm/degrees C of FSR (max)
Bipolar stability	±24 ppm/degrees C or FSR (max)
MONOTONICITY	0 to 50 degrees C
SETTLING TIME	10 microseconds max. to within 0.1% FSR for a 10 volt step with 1000 of load
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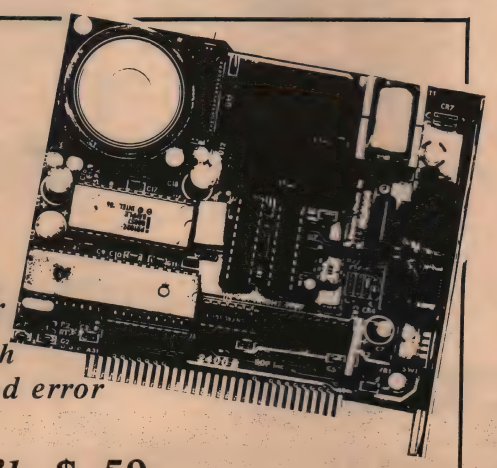

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3.000	1.15	13.17020	.70
3.120	1.20	13.440	1.00
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3.4560	1.49	15.000	.75
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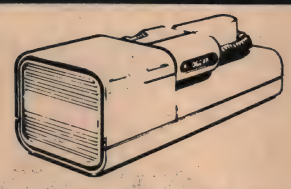

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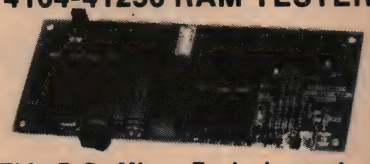

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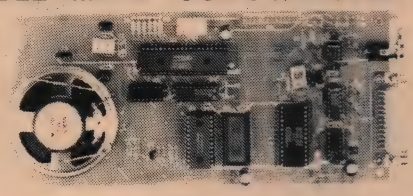

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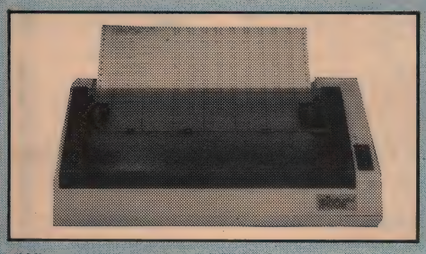

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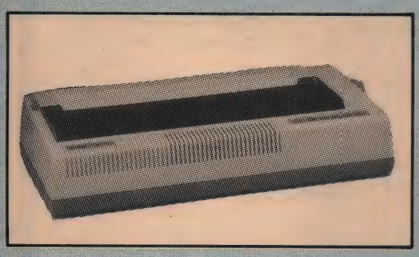

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- One Year Manufacturer's Warranty

star micronics Radix-10

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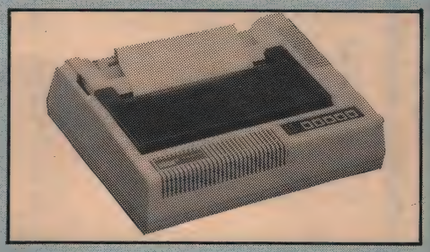

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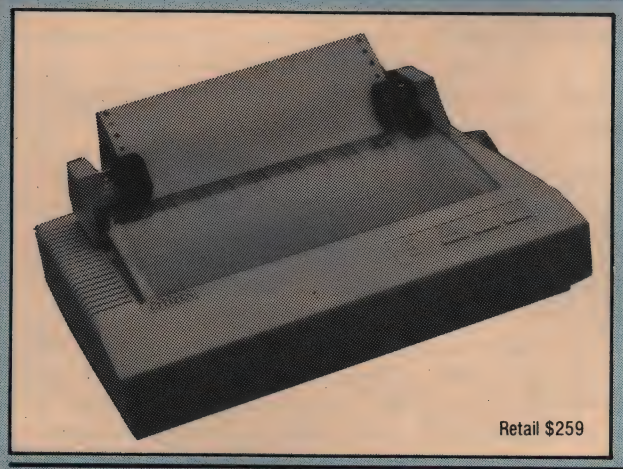

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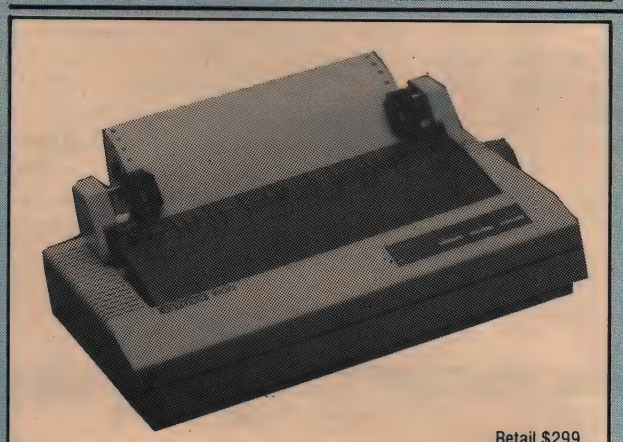

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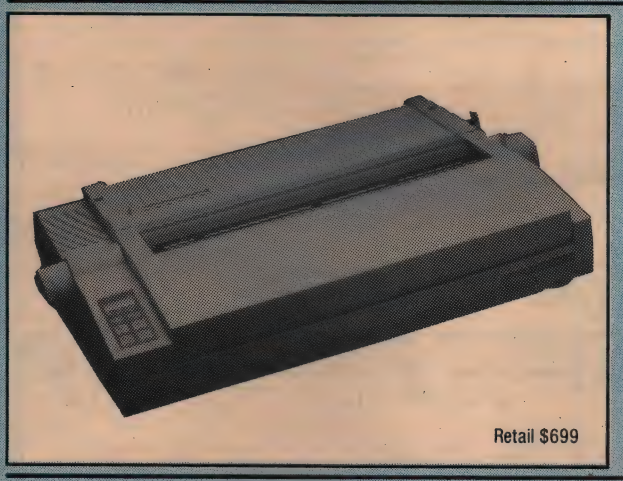

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Northgate Announces Support Of MSDOS 4.0

Northgate Computer Systems has announced that MSDOS 4.0 will become standard with all Northgate systems shipped after October 15th, 1988. Northgate has licensed the new release of MSDOS from Microsoft which will only be distributed through OEMs who will install it on their equipment.

Arthur Lazare, chairman of Northgate says that Microsoft has assured him that the version Northgate will provide does not contain "bugs" which have been reported in PCDOS 4.0. However, certain programs which Microsoft has warned developers will conflict with new versions of DOS, will await revision of third party software to be totally compatible with MSDOS 4.0. ●

WinDOS On Screen
continued from page 242

referencing (CROSS-REF) produces a number of topics that are related to CHKDSK. Selecting the CHKDSK report brings up a sample of the report that the command will generate. Cross referencing will also find an article on "Clusters" and "Disk Space Accounting." When you are finished reading, ALT-ESC takes you back to DOS or the application you were using.

I have used WinDOS with most of the applications that I run on a regular basis and have found no real conflicts. Every once in a while it will cause the cursor to skip through a paragraph in my word processor when I return from WinDOS but it does no damage. It is now part of my AUTOEXEC file and is in the background constantly. It is best loaded last in case you want to remove it from memory without booting again.

Use the tutorial at least once to become familiar with the structure of the WinDOS program and after that you won't need it again. By adding -GO to the parameter for initiating WinDOS it will skip the tutorial when you activate it by using ALT ESC.

If the authors of some of the reference texts that we are forced to endure put one fourth as much effort into indexing and referencing as Window Book, Inc. has put into WinDOS I would have spent a lot less hours ruining my eyes in the early morning hours trying to chase some train of thought or commands through loose leaf manuals. I hope that there will be many more such offerings from Window Book.

If you want to become more proficient with DOS WinDOS is definitely worth its price.

WinDOS price: $34.95
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RollCall: File Cards At Your Fingertips

by David Weinberger

How useful a utility is has everything to do with how you use your computer. For example, few people want to have to power on their PC just to look up a recipe that's only a few pages away in a cookbook on their kitchen shelf. But, if you happen to work in a restaurant that has computers at every station in the kitchen in order to assist with order tracking, then a popup recipe program suddenly becomes the perfect assistant.

In the same way, surely, no one would bother to boot a PC to get at a phone number when it's on your Rolodex a few inches away.

But, if your work has you booting your computer in the morning and only turning it off when you leave for the night (if then), then a popup Rolodex program becomes very useful. That's when you'll want to take a look at RollCall from Qandu Computing.

RollCall is a $49.95, memory resident program that's very simple to learn and use. It accomplishes what it has set out to do. The question is whether it has set out to do enough.

First, let's look at RollCall's features.

After loading RollCall into memory, you access it by an ALT-space hotkey (which can be changed by means of a special configuration program provided with the software). You are shown a popup menu which lets you search/edit records, add records, insert the date into a word processing document, quit, or release RollCall from memory. This last reclaims the 90K of RAM occupied by RollCall—a nice touch.

If you ask to add records, you are shown a screen with blanks for first name, last name, affiliation, street address, secondary address, city, state, zip, two phone numbers, and three comments. Adding information is simply a matter of typing it in. F1 resets the current field to its original value; F2 erases to the end of the field; HOME moves you to the beginning of the field, etc.

Let's say you have created a number of entries. Now you are writing a letter using your favorite word processor. You want to enter an address into it. Pop up RollCall, and tell it you want to do a search. You can search by last name or affiliation. Type in part of the last name. You are quickly taken to the appropriate card. (Qandu says searches take less than three seconds; I can't dispute that claim. Qandu found all my records in the blink of an eye.)

Now that you've found the right one, tell it to feed the information into the letter you're writing. The information is transferred to where your cursor was in the letter.

continued on page 339

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RollCall
continued from page 338

The information inserted consists of the first and last names, the address, and the affiliation. (You can also always enter the system date.) If you don't want any of these inserted, you surround it with carets (^). For example, if you creat a RollCall card with an affiliation field that says: " ^sleaze ball ^ Acme Novelty and Oil Co.," "sleaze ball" won't print into your document, but you will be able to search through your RollCall cards for cases where "affiliation = sleazeball."

The search method is simple: you state whether you want to search for the last name or for the affiliation. You type in the first letters of the field. It shows you the first matching case. You hit the "next" key to cycle through them. Unfortunately, it stops when you run out of matching instances, rather than letting you continue through alphabetically. More important, the search method does not allow for wild card searches.

If you are uncertain of the name you want to find, you can use the "scan" option, which will list the names and affiliations of all matching instances. You use a moving bar to select the one you want, hit enter, and RollCall retrieves the card. Here the lack of a wildcard capability isn't as bothersome, because if you search for "sm," it acts as if you asked for "sm*," i.e., it automatically shows you every possible completion. But, it would be useful to be able to get an on-screen listing of all the names in the list, i.e., "*.*."

If you enter a space as the only character when doing a search for affiliation, it will show you all the cards where the affiliation was left blank.

I found the insertion into word processors to be somewhat flaky with my system. With Word Perfect 5.0, it would insert 15 characters of the first and last name, wait for a keypress, drop down a line, insert a few more, wait for another keypress, and so forth. Worse, the keys you press in order to have it continue inserting themselves show up in the inserted material. So, if you press the space bar, you'll be sticking spaces into what you're trying to insert, and using the cursor keys changes the insertion point.

I had better results with other word processors. It worked fine with WordStar and with some plain ASCII editors. Even so, the only keys you can press to cause the inserted material to show up are the down arrow and the right arrow; any others either insert unwanted characters or move the insertion point.

I called the 800 number about the problem I had with Word Perfect 5.0. The people at the other end were helpful, knowledgeable, and friendly. They suggested several ways of fixing the problem, and offered to put me in touch with one of their engineers if I still had difficulties.

RollCall also comes with some additional utility programs. One prints any range of the cards. Another prints mailing labels. RCTUNEUP reports some information and lets you make some changes. Most important, RCTUNEUP tells you how many more records you have room for. (With 640K, 1 meg of extended memory, and a 30 meg hard disk, I have room for over 4,500 records.) It also lets you edit your CONFIG.SYS and AUTOEXEC.BAT. Unfortunately, RCTUNEUP blew up my screen display after I used it to edit AUTOEXEC.BAT; exiting the program returned it to normal. RCTUNEUP also reports on your system configuration, and contains some repair routines you run if you get error messages from RollCall. It's a thoughtful addition to the software.

Overall, then, RollCall does its job well. But is it the right job?

The problem with RollCall is that all your cards have to look alike. Compared to a program like MemoryMate (from Broderbund), RollCall looks hidebound.

MemoryMate is also a popup filer. But MemoryMate records can consist of any set of text you want, not just prefabricated blanks for fields the software designers have created for you. Further, you can retrieve data based on any text in a MemoryMate record, rather than just on the basis of two names and affiliation. For example, with MemoryMate you could look for all records which contain the word "doctor" and the word "heart" or "eye." You can search for records created or modified between any two dates. It also has a "tickler" function. MemoryMate seems as fast as RollCall in searches.

Further, MemoryMate not only lets you insert material into a word processing file, it also lets you paste material from the word processing file into a MemoryMate record.

What's the advantage of RollCall over MemoryMate? A few dollars, the immediate familiarity of a Rolodex-style card, the ability to print mailing labels, and the ability to insert the date into any document.

RollCall is a nice piece of software, and it does what it's supposed to do. Other programs, however, do more.

RollCall, Version 1.3
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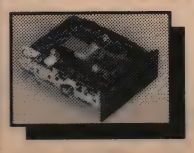

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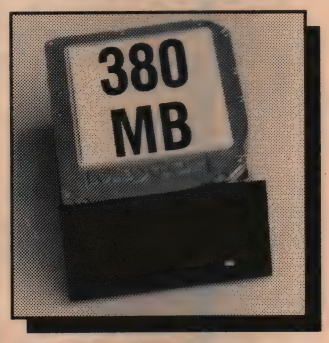

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Adventures With Ventura: Confessions Of A Venturophile

by Mark Worden

Xerox Ventura Publisher, the highly rated desktop publishing program, came into my life a year ago. It changed things. It didn't revolutionize my writing the way WordStar did when I first started writing with a computer in 1984. But Ventura extended the scope of word processing by giving me the opportunity to have the real feel of a published page without having to wait months, or even years, for publication.

I have become a full-fledged Venturophile.

On Venturophily: From Portable To Desktop

In becoming a Venturophile, I was forced to make some drastic changes in my standard equipment. In the past five years, I have co-authored, ghosted, and edited eleven books, written many magazine articles, worked as the West Coast correspondent for a monthly trade journal, and contributed from time to time to a newspaper syndicate. For most of this writing, I have used WordStar on a variety of portable and transportable computers, including Kaypro 2X, Bondwell 2, and a Toshiba T1100 Plus laptop. I've also done a lot of work on Tandy's Model 100 and Model 200.

Although my partner (Gayle Rosellini) and I wrote our first book on a Systel I (CP/M) dedicated word processor that used an Olympia EX1000 electronic typewriter as keyboard and printer, once we began using portables, we shunned desktop machines.

So why, then, a sudden move into desktop publishing? How come all this new equipment—none of it lap compatible, portable or even remotely transportable—suddenly fills a whole room of the house? I'm talking about an ALR 286 Dart, hard disk drives, Wyse 700 monitor, Hewlett-Packard Laserjet II and ScanJet. I'm talking about Xerox Ventura Publisher, IMSI DPG, Publisher's Paintbrush—not to mention fonts galore, screen capture, graphics file converters and so on.

I mean, we didn't really need all this desktop paraphernalia.

Or did we?

We did.

Stop The Presses!

It started when we were in the final prepublication draft stages of a self-help book on depression published in the fall of 1987. In going over the final edited version for indexing, I discovered the editors had made some drastic changes in our material.

We had written the book in our usual informal conversational style, and it had been turned into an awkwardly formal textbookish thing. In some places well-meaning editors had twisted and misinterpreted important theoretical points. In other places editors had simply substituted their writing for our own, sometimes replacing a single word with another "preferred" word. Whole sections had been rewritten and an extraordinary number of semi-colons had been strewn throughout the book. I loathe semi-colons.

Editors turned bullets into numbers, neutered bold text, and de-italicized text we'd wanted in italics for emphasis.

We had asked for boxed text in certain sections. No boxed text. We were told that the art people didn't have time.

A frantic phone call to our editor in the midwest (I'll call him Perk Maxwell) resulted in this conversation: "What's wrong" Perk Maxwell asked. We told him.

"It sounds like you just don't want to be edited," Perk Maxwell said petulantly.

Whoa. We'd already published one book with this same publisher—no editing problems. We had just completed the final editing of a book with another publisher where we'd rewritten a lot of material and cut about 100 pages of text. I've been edited by magazine editors and newspaper editors, and when I was the editor of a magazine I had hovered over a scrupulous layout artist and painfully watched her excise my carefully crafted words with an Xacto knife because there wasn't enough space in the magazine for a jump.

With our depression book we hadn't been consulted about any of the changes. In the past, when there had been problems with text, an editor had called us or returned the material with suggestions for changes. But early on, Perk Maxwell had deftly parried our questions about the editing of this book by assuring us that editors were making only "minor changes" in the manuscript.

Editors? We thought we were working with one editor. Well, yes, Perk Maxwell told us, basically that's true. He was the main editor. After his editing, the edited copy was then passed on to other editors, who made their own changes. And then it was passed on to the High Mucky-Muck Editor. Who had this affinity for semi-colons.

Now get this: None of secondary and tertiary editing crew worked from a copy of the original manuscript.

Ahh. No wonder it appeared so warped. The book was like the proverbial camel: A horse put together by a committee.

"Well, it isn't that bad," Perk Maxwell said huffily, offended at the notion that a committee of editors might err.

"Stop the presses!" we cried.

"Too late," Perk Maxwell told us. "The book's already gone to the typesetter."

"That's all right," we said. "Here are the changes we want—here are the things we want reinstated." We started telling him.

"Wait," he said. "You can't have all these changes."

Us: Why not?

Perk Maxwell (fretting): The book's on a tight schedule and we're already behind. It's supposed to be in the warehouse by July 1 and that's only six weeks off.

Us (firmly): That's okay. We want these changes.

Perk Maxwell (veiled threat): Jeez, if you do that it's gonna cost you a lot of money.

Us (bewildered): How come? You guys made the mistakes.

Perk M. (triumphantly): Yeah, well, you'd better take another look at your contract.

Beyond The Contract

Hmmm. "Authors will be responsible for the cost of changes made in typeset material."

Somehow it doesn't seem fair. But okay, we muttered, we want the changes. "We'll pay."

More resistance. Perk Maxwell has to check with the High Mucky-Muck Editor. Meanwhile we go through the manuscript and make the changes we want. When Perk Maxwell gets back to us, he says, "Sorry, no can do. It's just too late to make the changes."

Deep breath. "Okay. We want the book back.."

"What?"

"We'd rather have the book back then see it published in its present form. It isn't our book." Now comes the really painful part. "We're ready to send back our advance."

Perk Maxwell was stunned. He'd dealt with a lot of whining writers before, but no one had ever threatened to withdraw a book. Especially after

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Paradox OS/2 continued from page 243

comes with quick guides for both Lotus and dBase users.

Paradox Vs. dBase III Plus

For the most part Paradox matches every feature of dBase with plenty to spare, but there are noticeable differences.

On the minus side, dBase has the "carry" command which duplicates all field entries from one record to the next blank record, making minor modifications in data very fast.

Another minor inconvenience is lack of dBase's "history" command that automatically records keystrokes. Paradox can do the same thing, but it is a little more complicated to arrange.

To balance these quite minor lacks, Paradox introduces the "calculated field" which, as the name implies, lets you operate on one or more fields to create data for another field.

Expressions can be up to 175 characters long and use field names, arithmetic operators, constants, and special terms like Count and Average.

Using calculated fields can eliminate the need to export data from, say, dBase to Lotus to perform calculations, then go back to dBase to sort, query, and generate reports.

Conclusions

The major additions to the OS/2 version are in the special multi-tasking provisions and support for large memory (up to 16MB RAM), which are, after all, most of what OS/2 has promised.

Paradox OS/2 conserves resources by only loading one copy of the program into memory, no matter how many separate sessions you open, and with the memory limitation command available at the command line.

At $725 and requiring both OS/2 and a minimum of 3MB RAM, Paradox is not the program of choice for managing your Christmas mailing list, at least not unless you could fill a small stadium, but as a major relational database for business applications the DOS version of Paradox is hard to beat and with the addition of support for very large memory and a transparent multi-tasking capability, it moves to the top of the programmable database programs available for PCs.

Although there is no outward appearance that the OS/2 version of Paradox is in any way different from the DOS version, you can tell that it is more than a simple part of the original program by the way it manages OS/2's resources so well that running multiple tasks doesn't impose any important speed penalty.

The fact that it doesn't look different or require more complex programming than the DOS version is a measure of its sophistication and not to be confused with lack of power. The only major feature of OS/2 that this program doesn't make use of is the presentation manager, and, if you haven't noticed, it isn't available yet, and Paradox probably won't need it when it is available.

The only major change in programming is that applications written in the PAL language are now able to spawn multiple threads to perform operations in the background without operator attention, something that is almost transparent but nonetheless a very powerful feature.

Most of the stumbling blocks that people encounter in learning Paradox are due to their having used other database programs in the past. Those who have used Lotus as a limited database will find Paradox not only extremely powerful but easy to learn.

If you need a powerful database that can be used for applications development or as is, Paradox is one that you probably won't outgrow.

The ultimate limits of Paradox 2.0 are the same for both DOS and OS/2 versions, all probably large enough to leave you plenty of elbow room; a single table can hold:

Two billion records; 255 columns; 4,000 characters/record; 255 characters/field; 15 pages/form, 15 custom reports/table; and an unlimited number of tables/query.

Paradox 2.0 for OS/2 (there wasn't a release 1.0; the numbering started with 2.0 to keep it consistent with the DOS versions) comes on both size diskettes, with four high-density 3.5" and four high-density 5.25" disks included in the package.

List price: $725

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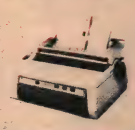

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Aldus PageMaker

continued from page 241

of graphics you insert into documents, and Version 3.0 provides many options that make this feature both simple to use and powerful.

Requirements

For many, hardware considerations are just as important as PageMaker's price, since, although PageMaker will run on any Windows compatible computer, to be really useful PageMaker requires a fast computer with lots of disk space and high resolution graphics.

Aldus lists minimum requirements as an AT or PS/2, 10MB hard disk (20MB recommended), EGA, VGA, or Hercules graphics, 640K RAM, and DOS 3.0 or better, and, although it is possible to work with a bit less power, I wouldn't recommend it and would actually encourage using a very fast machine.

Not only is desktop publishing by itself a heavy duty job for any computer, PageMaker only works in Microsoft Windows, a nice environment that is unfortunately so slow that it crawls on anything less than a 12MHz machine.

I didn't mention the cost of Windows and the need for it earlier, because PageMaker comes with a run time version, so if you don't already have Windows you needn't make the additional investment, but having a full working version of Windows does give you the opportunity to import text and graphics from Windows' notepad and graphics program.

In Use

I loaded and tested PageMaker on an Amdek/386 (16MHz) using the fantastic WYSE/AMDEK 1280 monochrome monitor that provides 1280x800 resolution or 50-line-by-160-column display, and using a Logitech C6 mouse.

On the 1280 monitor you can actually view images of two full 8½x11 pages side by side in great detail, giving you an excellent feel for the final appearance of your document.

Graphics are generally shown as grey areas at that level of magnification, and only the largest text fonts are readable, but the body text is shown by a technique called Greeking, where the actual lengths of words are displayed by converting readable text into "simulated" text that accurately shows placement and appearance of the final text.

PageMaker offers a number of viewing options, with this full double page being the smallest. Other images, more suitable for lesser monitors, let you view individual characters much as you would with a word processor, but at this level of magnification you quickly lose a feel for the overall document, so it is important to keep switching back to the wide view to keep perspective.

WYSIWYG (What You See Is What You Get) is a regularly touted feature of everything from the simplest word processor to the best in desktop publishing programs, but until you have seen what Aldus PageMaker looks like on a high resolution monitor, you haven't seen WYSIWYG.

Seeing every type size and style on screen, just as your laser printer will output them is a powerful attraction for the top of the line desktop publishing programs, and nothing matches the rather erie feeling of watching letters and words "crawl" around on a line as you enter or delete characters, reflecting not just proportional spacing, but true typeset appearance.

Typeset characters, by the way, are those whose spacing depends not on some arbitrary spacing criteria, but vary with the number of characters and spaces on a line. PageMaker even offers both automatic and custom kerning.

Creating perfect looking documents doesn't even require using a separate dictionary for hyphenation, because the supplied 110,000 word Houghton-Mifflin software can automatically hyphenate text.

Design

The dotted lines you superimpose on your blank pages when creating your initial document templates make it much easier to keep everything looking neat, as long as you made decent choices to begin with.

This isn't the place for a lesson in page design, but unless you are really experienced it is a very good idea to keep things simple and rely on the templates provided by Aldus as much as possible. Fancy type styles, or too many different styles in the same document, are the easy road to creating a document that is almost unreadable and fancy designs are something that should only be attempted by true artists.

This is probably the biggest gripe people have with desktop publishing, it is so simple to use that newsletters, brochures, and even magazines are being designed by people who may write well, but have no business being involved in design, and therefore create vast quantities of poorly designed documents.

Stick with Aldus's guidelines, and even if you have no artistic talent, you will probably come up with a superior looking product.

Imports/Exports

Even though PageMaker is an all-American program, imports are an important factor, imports of text and graphics, that is!

Since PageMaker has only limited word processing capabilities, users will want to import text files from elsewhere, and Version 3.0 provides plenty of options, the most important one possibly being the ability to both import and export PageMaker files between PC and Macintosh versions of the program, a feature that originated with Version 1.0a (Version 1.0 could only export from PC to Macintosh).

You can also import files in ASCII or from Windows Paint, Windows Write, or Microsoft Word, and you can even import style sheets created in MS Word into your Aldus PageMaker document.

Filters are used to import and export text and graphics files, and PageMaker comes with the ones already listed installed, along with filters for WordStar,

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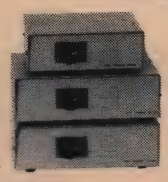

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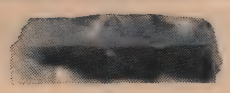

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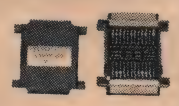

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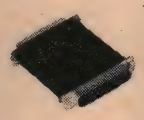

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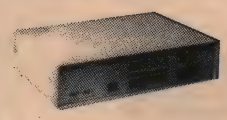

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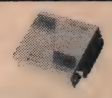

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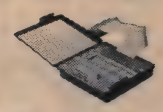

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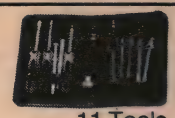

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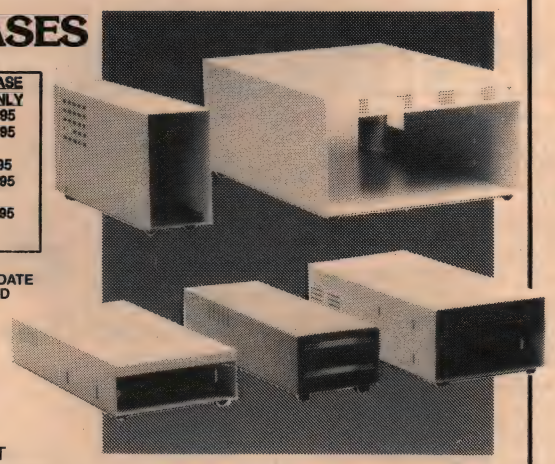

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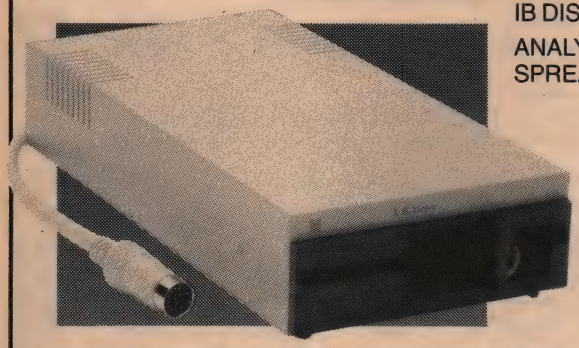

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Aldus PageMaker
continued from page 342

Multimate, AutoCAD, XyWrite, MacPaint, and more.

Since filters take up a lot of room, others can be separately installed as needed, up to 10 at a time. These others include Samna Word, PC Write, Lotus 1-2-3/Symphony, AdvanceWrite, DCA, and Zenographics Mirage.

Printers

A page layout program without a wide selection of printer drivers would be worthless, and PageMaker certainly has lots of built-in support, including PostScript for Apple LaserWriter, IBM Personal Pageprinter, and Linotronic, and PCL/LaserJet for the H-P family and compatible laser printers which included the Okidata, Quadram, Epson, and Tandy laser printers.

Other supported printers include any that have Windows compatible printer driver, such as Epson FX-80 and LQ 2500 dot matrix printers.

Color is available on NEC P5XL, Fujitsu DL2400, and H-P PaintJet printers.

Typesetters supported include Compugraphic and Varityper, in addition to the already listed Linotronic 300 which provides up to 2,540 dpi resolution vs the 300 dpi available on the usual laser printers.

Graphics

A number of graphics scanners using either bi-level or grey-scale TIFF (Tag Image File Format) files are supported, as are specific scanners including some from Canon, Microtek, Datacopy, and Turboscan.

You can either import graphics, then enlarge or reduce them to fit, or create a cropping window and then move the graphics (usually photographs) around until it is correctly cropped.

Contrast and brightness are under complete control as is the density of screen used to filter photographic images (this adjusts the coarseness of the image).

Color printing using registration marks and overlays is supported, and you can define colors using one of three color models:

Cyan, Magenta, Yellow and Black (CMYK); Hue, Light and Saturation (HLS); or Red, Green, and Blue (RGB).

Fontware

Bitstream's Fontware program is included with PageMaker and with it you can create as many screen and printer type fonts, ranging from 6 to 72 point, as you desire. The software comes with Dutch (Times), Swiss (Helvetica), Courier 10, and a Symbol A proportional typefaces.

Fontware only works with PCL printers such as the Hewlett-Packard LaserJet Series II and requires 1MB of memory in the laser printer.

Using this software you don't actually create type faces using graphics tools; rather, you specify the style you want to use, such as Dutch, and the point size, say 12 points, and the program builds the entire font to send (upload) to your printer.

This gives you a tremendous number of possible fonts, but don't get carried away; first of all, it doesn't look good to have a lot of different fonts in the same document, and, second, it takes about five minutes to create one complete font on a 12MHz computer and from 30-50K to store each font on disk (up to 150K for some headline fonts).

You also need to specify your monitor and create a display font if you want to take full advantage of PageMaker's preview feature, but you can also create a font just for the printer or just for the screen.

If any one thinks this is a lot of work to go through just to get different type faces, I invite him or her to drop by my place and help sort the metal type I used for years with my Kelsey printing press. Those little bits of metal all look alike after you have replaced the first thousand or so in the correct holders, and a few hours of that exercise will make anyone appreciate why Ben Franklin used apprentices to do the cleanup jobs after printing the almanac.

Conclusions

Aldus is still the king of desktop publishing; with more than 200,000 units of PageMaker installed, this program is vying to establish itself as an industry standard.

The ability to import dBase, Symphony, and Lotus 1-2-3 compatible files is very important for business users, and its power, flexibility, and surprising ease of use make it perfectly usable for doing small, quick-and-dirty design and printing jobs as well as major productions, though it is unlikely that you would want to purchase it for those small jobs alone.

PageMaker doesn't do everything; for instance, it is not intended as a text editor, though it can be used to type in or delete small amounts of text, and it also can't produce images or graphics, although it can do a fine job cropping or modifying images scanned in or produced by graphics programs.

At $795 PageMaker certainly isn't inexpensive; you could probably buy a good used laser printer and get a copy of Publish-It! for less, but, on the other hand, you couldn't produce a fine-quality magazine or advertising brochure very easily in other, lesser programs, and anyone needing to present him or herself in print would do well to remember that when a person has nothing to judge you by but your finished product it only costs a few hundred more to make your work look as professional as anything turned out by a Fortune 500 company if you design in PageMaker and have your work printed at a top printer.

This is a top-of-the-line program, intended for serious users, but with more than 100,000 newsletters published in this country alone, and hundreds of thousands of clubs and community groups producing bulletins and flyers every day, an $800 publishing program isn't priced out of this market; many people could make use of its power, and just a few years ago an equivalent setup would have involved hiring staff and equipping an art department, as well as buying a typesetting machine.

Aldus PageMaker is a perfectly reasonable software selection for school

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Adventures With Ventura
continued from page 340

an advance had been paid. So he huddled with his boss again and finally says that we can make some changes. "Try to keep them to a minimum, and remember the more changes you make, the more it's gonna cost you."

So working under pressure, we made the changes. We still didn't get boxed text. But at least the book was more of a Rosellini and Worden book than bad text between covers by anonymous editors.

Just before all of this editorial brouhaha took place, we'd sent off our first draft of another contracted book to the same publisher. And about that time I began to notice ads and reviews of desktop publishing programs. When I mentioned desktop publishing to Perk Maxwell, he was, to put it mildly, unenthusiastic. "You just want to bypass our editing process," he said.

Well, yes—"No," I lied. "By golly, it could sure help give us a better idea of what the final version would look like. And it would really help in doing the index."

He didn't want to talk about it.

Fine. Besides, desktop publishing seemed a bit upscale. This was shortly before AT clones became ubiquitous and affordable and before the new lines of low-end laser printers were widely available.

So desktop publishing went to the bottom of my agenda.

Then we got a copy of our depression book hot off the presses.

And we got a bill for $500 worth of re-set type.

Our hasty last minute changes hadn't caught all the bad writing, and a plethora of semi-colons had escaped scrutiny and smugly sat there like mocking mutants. Egad! semicolons—effete hybrid punctuation, with neither the smooth pause of the comma nor the assertive full stop of a period.

And there was something wrong with the spacing—the pages looked print dense, dark and foreboding. Not enough white space, not enough space between body text and subheads. It didn't look like an easy book to read. (We learned later that the typesetter had set the pages to the wrong page size, creating a nightmare for layout people.)

Sigh. Don't look back.

"Get Ventura"

In September of '87, I began getting edited copy back for the final version of our new book. We had succeeded in getting a major concession from our publisher: We would "be allowed" to see "suggested" editing changes, and we might even have the opportunity to negotiate changes before typesetting. (This was an unprecedented concession at this publishing house. From talking with editors, it was clear that they considered writers to be obstacles in the publishing business. One editor even spoke disdainfully of "inventing" manuscripts.)

Still, as Gayle and I looked over the edited copy, we had a familiar sinking feeling. No matter how much we "negotiated," they would always be in a position to have the final say.

Unless...

"It isn't going to happen again," Gayle said grimly. "Get Ventura."

Of course she didn't know what she was talking about. One just didn't get Xerox Ventura Publisher. She was opening the door for a whole new approach to writing and publishing. She was also talking about a considerable investment in time and money.

"That's okay," she snarled. "Get Ventura."

By the middle of October, we had our basic DTP set-up and had transferred the WordStar files of our book into Ventura format. I tinkered with several different style sheets and began to discover the graphics possibilities. (We had never seriously considered using graphics in our books because of the problems we encountered when trying to get boxed text.) By the first of November, we had the book designed and were waiting for the final edited chapters. About once a week our new editor (I'll call him Ross) called. "How're you coming on the changes?" he'd ask nervously, convinced he was dealing with a couple of temperamental prima donnas who'd go into a snit at the sight of a semi-colon. "When can we start getting the edited version back?"

We were evasive."Just get the rest of the book back to us. We want to take a look at the whole manuscript before we send back revised copy."

On November 24, we shipped the Ventura version. A few days later Ross called. He got the manuscript. What did he think of it? There was a hint of doomsday in his hesitation. "Well," Ross said tentatively, "did you have it typeset?"

What a relief. The Ventura version looked so good that Ross and Perk Maxwell and even the High Mucky Muck editor all thought we'd gone to a

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Aldus PageMaker
continued from page 344

newspapers and for print shops interested in expanding into newsletter production, as well as anyone who wants to start a design service business; as with earlier versions, its most endearing feature is how easy it is to learn to use, and with the powerful features added in the latest version, including templates, stylesheets, and autowordwrap, it is even easier to use than before.

Aldus PageMaker Version 3.0 costs $795 (upgrades $95) and requires a computer that runs Windows 2.0 or later, or its supplied runtime version of Windows. Other minimum requirements include 640K RAM, but PageMaker will happily spread into expanded or extended memory and can make good use of the elbowroom; the recommended 20MB hard disk will quickly fill up with fonts if you get too creative.

For more information contact: Aldus Corp., 411 First Ave. South, Suite 200, Seattle, WA 98104; (206) 628-2375. ●

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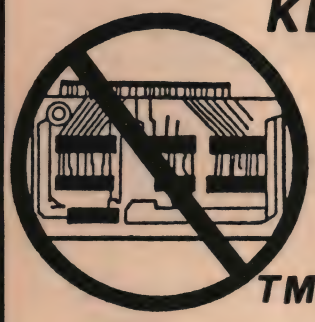

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Adventures With Ventura
continued from page 345

typesetter in an attempt to bypass their editorial committees.

We assured Ross that we'd produced the manuscript with Ventura in our electronic cottage. And more: any change in design or format could be done instantly through Ventura and turned around to the publisher in two days, max.

To our great pleasure, the editing crew was excited. They'd been trying to get their old signature system to do this kind of stuff and now that they'd seen Ventura in action, they were—well, envious. Everyone except Perk Maxwell. He conceded that the book looked pretty good. But the graphics were amateurish. "You used clip art," he sneered.

"That's right," we said. "But at least we've got art. And boxed text. Which is more than we were able to get in our two previous books."

The next call we got from Ross was even more favorable. The Ventura version might be usable as camera-ready copy. It looked like this was going to save about 20 days of production time, not counting typesetting and other miscellaneous costs.

Ross had to get together with the head of the art department to go over the design and make suggested changes. Meanwhile the head of marketing called and asked if I could run off seven special pre-publication review copies. We were on a roll.

Ross promised to call us soon to give us their proofreading corrections. "There's nothing major," he assured us. "Just a few small corrections." Of course we'd heard that before. But that was then, pre-Ventura. This was now, the New Era of Desktop Publishing.

Back To Square One?

We waited. And waited. And waited. Ross was supposed to get back to me. I called him. We made an appointment to go over the material on the phone. The date passed. I called him again. He apologized and we rescheduled for January 4, 1988. He forgot. Would get back to me on Wednesday.

Wednesday Perk Maxwell called. "I'm afraid I have some not so good news," he said. "We aren't going to be able to use your Ventura manuscript for camera-ready copy." Now this was not a terribly big disappointment, because we knew that the Laserjet copy might not be acceptable (although few readers could distinguish it from typeset material). We knew, however, that Ventura could be put through a Linotronic high resolution typesetting system and still save time and money.

But Perk Maxwell went on: I'm afraid we can't use the Ventura in any way."

"What th—" we sputtered, sensing another publishing debacle beginning to rear its monstrous head.

He paused. "We'd like to have you put the book back into WordStar on Systel III disks, and we'll have it typeset." In other words, back to CP/M, back to square one.

What was wrong with the Ventura version? Well, he finally admitted, nothing was actually wrong with the Ventura version. But they had this system, see, where the books were edited and the copy went to the art people who signed off on type and design and, well, the art people wouldn't sign off on the Ventura version. The art people wanted to get the manuscript the way they always had—in WordStar, so they could spec the type and design.

Now this was the same art department who refused to give us boxed text in two previous books.

It turns out that our Ventura version brought to a boil a long-simmering turf dispute between editorial folks and art folks. The editorial folks wanted to move into the desktop publishing arena, which means that they would have greater control over design. And the art people saw this move as an encroachment on their domain. As bad luck would have it, in this particular publishing house, Editorial and Art are separate, but equal, departments.

"Jeez, that's interesting," we told Perk Maxwell. "But we're really disappointed that you can't use our copy—which would save time and money—because of a turf dispute. And we're really sorry that we just don't have the time to give you the manuscript in WordStar." We suggested some alternatives: Have your secretary retype the material. Get the art folks to retype the material. Re-type the damned book yourself. Or stick it, as the saying goes, where the sun don't shine.

Happy Ending

Editorial and Art went back into conference. Meanwhile Ross wanted to know if there was a way for a typesetter to use the Ventura version. Sure, I told him. Ventura can be output on Linotronic typesetting machines. And some typesetters have a program that can convert Ventura codes and produce camera-ready copy.

Ross located a typesetter who could work with Ventura and asked for a few sample pages. He got the samples, was impressed and joined the Ventura bandwagon.

The dispute between Editorial and Art was gingerly resolved. Editorial would get to use the Ventura version. Art would spec the type and the design—and would provide acceptable graphics. (At Perk Maxwell's suggestion, I used Garamond 11 for body text. Art decided to use an obscure typeface, Palladium [sometimes called California] that was only available on this particular typesetting machine.) Of course I preferred our clip art, but accepted the compromise.

I sent our Ventura files on disk to the typesetter, and the book came together. It was published in June 1988. And it looked goooood! As Mike Hammer said in *I, The Jury* when he pumped a .45 slug into the naked belly of the lovely, but treacherous psychiatrist, Charlotte Manning: "It was easy."

What I Learned Along The Way

Shop around. Here's what I paid for my basic system:

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New Mix C Compiler Brings Mixed Results

by David Weinberger

Editor's Note: Although we published another review of Mix C Compiler last month, we are presenting another opinion this month. With most of the attention being given to versions from the major houses, we are pleased to be able to present a thorough analysis of a different C compiler.

Before the Great Borland-Microsoft C War began, Mix was there with a powerful C compiler complete with integrated editor, for under $100. In response to the entrance of the giants, Mix has introduced a new version (Power C) of its original C compiler (Mix C). On the up side, they've cut the price of their compiler to an unbelievable $19.95. On the down side, Power C is an upgrade.

How can an upgrade be bad news? The answer is another riddle: When is an upgrade not an upgrade? An upgrade isn't an upgrade when it takes over twice as long to compile files. The performance problem, as well as some others, make Power C a Mixed blessing, and leave Borland's Turbo C and Microsoft's Quick C preferable as the places for beginners to start. Table 1 shows some sample timings for Turbo C, Quick C, and the two versions of Mix C. (I've included timings for Turbo and Quick both in memory when within their editor and in batch mode from the command line. Mix only has the batch mode, although it can be conveniently invoked from within the Mix editor.)

The decrease in performance seems to be almost entirely due to the fact that after each compile Mix now insists on optimizing the file, whether you want it to or not. In the previous version, optimization was accomplished at the user's discretion by running the code through special optimizing programs. The old way makes more sense. Optimization—making the compiled version smaller or run faster, or both—is the very last step in program development. Making optimization a requirement, especially when it doubles the compilation time, is—unless I'm missing something—a dumb thing to do.

If that were all there were to the story, this review could end right now with the phrase: Not Recommended. But there's another piece of the picture. Power C may be slower than Turbo C and Quick C (actually, it's slower than Turbo and Quick combined), but for another twenty bucks Mix will sell you its amazingly wonderful debugger, Ctrace.

There are actually three portions of the Mix environment. In addition to the compiler and the debugger, there's Mix Edit, an editor loosely integrated with Power C. It costs $19.95.

Let's look at each portion individually.

Powerful, Flawed Compiler

The Power C compiler is not a toy. It's a powerful compiler that could stand you in good stead (if certain improvements were made) well beyond the early stages of your development as a crack C programmer. The main improvement in Power C over its previous incarnation as Mix C is that it is ANSI compatible, rather than K&R compatible. ANSI is a new standard in Cs, that seems to be replacing the first edition of K&R (Kernighan and Ritchie). And the big improvement ANSI brings is that when you declare functions in your program, you can specify what type of arguments they will accept. For example, if you have a function that takes a string of characters and reverses their order, ANSI lets you specify that any attempt to pass it numbers will be flagged as an error. This is important because calling a procedure while passing it information of

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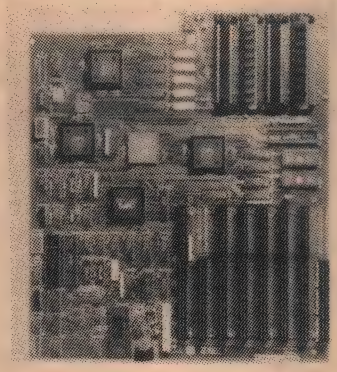

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New Mix C
continued from page 348

an inappropriate type is one of the easiest errors to make in C. (And in C, there are lots of errors that are easy to make.)

In addition, Power C comes with over 400 procedures which let you do everything from manipulate strings to draw pie segments. The upgrade is responsible for hundreds of those procedures.

The new documentation improves the previous version's. It includes a single, unified index, instead of separate indexes for each section (tutorial, reference sections, sections describing how to use the compiler and linker), a better arrangement than in Mix C's documentation. Also, the new documentation is better looking and easier to read. It includes lots of examples and is enough to get you going in C if you already know another language. (There's at least one Mix C function—iofilter()—which is accepted by the Power C compiler, but which is undocumented in the Power C manual. It's also extraordinarily hard to find in the original Mix C manual.)

Still, Mix's C documentation is far better than Borland's. Borland's documentation is designed for experienced C hackers, which is surprising given Borland's success with programming products for beginners. The Mix documentation is also better than Microsoft's, although Microsoft's isn't bad. Mix's is far more complete, contains a more thorough tutorial, and often just explains its topics better. (On the other hand, you can get on-line help with both Turbo C and Quick C, so that if you forget the syntax of an expression, you need not thumb through the book.)

A major problem with both versions of the Mix compiler is that it's unreliable. It refuses to compile programs that Turbo C and Quick C accept without complaint. Even the Quick C compiler from Microsoft doesn't always work the way it's supposed to—some files that it rejects, the full Microsoft compiler (Version 5.0) accepts. So it's really a question of how unreliable the compiler is. In my experience, the Mix compilers (both versions) are unacceptably unreliable. At some point, almost any program over 400 or 500 lines will be rejected by the Mix compiler but accepted by others.

And of course the debugger can't work on files that haven't been compiled so you may never know why it isn't working.

Configurable Editor

The editor has strong and weak points. It is highly configurable, through a relatively obscure setup file. It comes set up to emulate WordStar (as do the Borland and Microsoft editors), but you can change almost every aspect of it. It's a split screen editor, which lets you work on two files simultaneously, a feat neither Microsoft nor Borland has figured out yet. On the negative side, it doesn't handle some simple operations—particularly moving even small blocks of text—in predictable ways. And it expects the user to know to page out to disk files too large for memory, rather than handling that automatically for the user as virtually every program in existence does.

You can compile your file from within the editor, although it doesn't do this in memory as the other editors do. This doesn't really make much difference if you're using a hard disk. If there are errors, the editor leaves your cursor on the errant line; you can easily move to the line with the next error, and so forth. Overall, the editor is adequate but not great. If you don't like it, you can use the editor of your choice, but you'll have to exit it to compile. The list of errors is automatically written into a file named "c.err."

Magnificent Debugger

The Ctrace debugger is where Mix really shines. It is magnificent. It's not only better than the stripped-down debugger Microsoft includes with Quick C, it's better than the full debugger Microsoft provides with its high-end compiler (Codeview).

Ctrace shows you up to four windows of information. There are seven different types of window: source, variable

continued on page 350

Table 1

	Mix C (1.1)	Power C (1.1.3)	Turbo C (1.5) Mem.	Turbo C (1.5) Batch	Quick C (1.0) Mem.	Quick C (1.0) Batch
Compile	41	81	23	40	22	55
Link	7	17	-	-	-	-
Total	48	98	23	40	22	55
Size(K)	25.6	26.4	-	16.3	-	17.1

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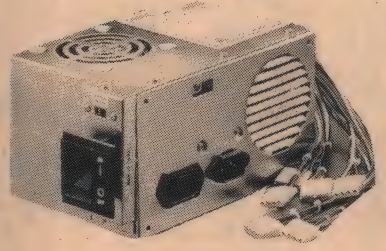

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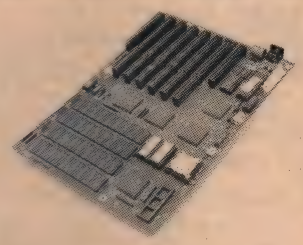

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New Mix C
continued from page 349

and their values, memory dump, symbols, watch points, output screen, and—new in the latest version—the assembly language version of your program. If you run the program in trace mode, each line of your source code will be highlighted as the program executes. In addition, the variables window will show you the value of your variables as they change. You can set breakpoints so that the program executes only up to a certain line. And you can set watchpoints in a wide variety of ways so that, for example, the program will stop when a particular variable reaches a particular value. This is very useful when you're examining a loop. You may know that it's OK up to the 1,000th iteration, in which case you could have Ctrace stop execution only when the index (the variable that's counting how many times the loop has executed) reaches 1,001. You can also alter the value of a variable while in the middle of the program's execution simply by changing it within the variables window.

There's a lot more you can do with Ctrace: change values in memory, backtrace 127 steps, display information in a variety of styles (e.g., as strings, hex values or ASCII), and configure the system almost anyway you want. It is a superb piece of software. Once you've used it, nothing else will do—when it works.

Ctrace seems to quit on programs for no good reason. Programs that Power C successfully compiles, programs that the other compilers accept, programs that Microsoft's Codeview can debug, can cause Ctrace to crash.

Conclusions

Clearly, Mix has given us a mixed set of products. The editor is adquate but not great. The compiler has strengths (ANSI compatibility, low cost) and weaknesses (poor performance, flakiness) and the debugger is magnificent. What does it boil down to?

Normally, the compiler is the centerpiece of a package like this. And taken on those terms, it's hard to recommend the Mix bundle when for about another twenty dollars you can get either Turbo C or Quick C at discount prices. (I generally prefer Quick C because it supports a mouse and because its built-in debugger—while not as good as Ctrace—is handy. Turbo C, however, is no slouch. It's a very well designed environment with lots of built-in graphics routines and a robust compiler.)

But there's another way to look at the bundle. Don't think of it as a compiler with an editor and debugger attached. Think of it as a debugger with a compiler attached as a front end. I find that I work in either Turbo C or Quick C until I need the help of Ctrace. Then I recompile using the Mix compiler and use Mix's debugger. Ctrace is worth the price of the entire bundle.

Even using this method, the older version of the Mix compiler is preferable because of the performance problem of the new version, unless you need ANSI compatiblity or the new functions provided with the system. You can get the entire Mix C bundle—compiler, debugger, editor—for $40.

For people who want to break into C programming, the combination of the Mix C bundle and either Borland or Microsoft's low-end C products is a powerhouse. If you need ANSI compatibility, then the Power C compiler is a low-cost place to begin that happens to bring with it a dream of a debugger. ●

Adventures With Ventura
continued from page 346

hard disk: $2100 (You can get by with an XT, but a hard drive is a must).

Hewlett-Packard LaserJet Series II: $170.

Hewlett-Packard ScanJet w/board and software: $1495 (Not an essential, but nice to have).

Wyse 700 15" 1200x800 monitor & video board: $699 (Ventura works well with a lower-priced Hercules compatible monitor).

Then there's the mouse (essential) and graphics packages—all available at discounted street prices.

If you want to do a lot of graphics or use large fonts, you will need to have a laser printer with more than the standard 512K of memory that comes with the LaserJet II. (Shortly before the price of RAM went up, I got a memory upgrade board for the LJII with 1MB of memory, expandable to 3MB: $399.)

Ventura ain't perfect. I used Ventura 1.1 and the indexing feature wouldn't work right. Patch 1 came out while I was working on the index and it promised to cure all. It didn't. I ended up doing the index the old fashioned way. (But it was easier, because I worked right from Ventura copy which had pagination identical to the final typeset version.)

Ventura (or any desktop publishing program) may not be very useful to most writers. For one thing, writers don't always have the problems we encountered. Despite the hype and hoorah, not everyone eagerly embraces desktop publishing. Editors don't always relish the prospect of legions of writers submitting manuscripts in Ventura (or Pagemaker, or any other DTP package). If the magazine or book publisher still uses traditional typesetting, editors may find it more convenient and expedient to work with ASCII text.

Finally, a Ventura may even be hazardous to a writing career. Tinkering with enchanting programs and equipment can become a substitute for the hard work of writing. And there are times, oh there are times, when your brain checks out, gives up the ghost and goes hiking in the Big Horn Crags in Idaho's Primitive Area, while your carcass squats blissfully in front of a computer and rearranges sub-directories, revise style sheets and dabbles with fonts and graphics and God knows what, and there is no urge or burning desire tc write and revise and revise again. Nc urge at all. ●

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Fontastic Is Fantastic Shareware!

by Hal Nieburg

Fonts can be of any size and enclosed by decorative boxes and borders. Once designed and selected, the fonts and graphics can be rendered on hard copy by merely imbedding a few colon commands (code letters preceded by a colon) in any text file. By this means, the printer is transformed into a cornucopia of surprises.

In nimble hands this software becomes an inexpensive approach to page composition and to dazzling typographic designs. Not just a word play, but also an inventive and brilliant play on the potentials of dot matrix printing, Fontastic is a font library and font editor of impressive capabilities. And now it is available as user-supported shareware on many of the nation's bulletin boards (registration fee, $49).

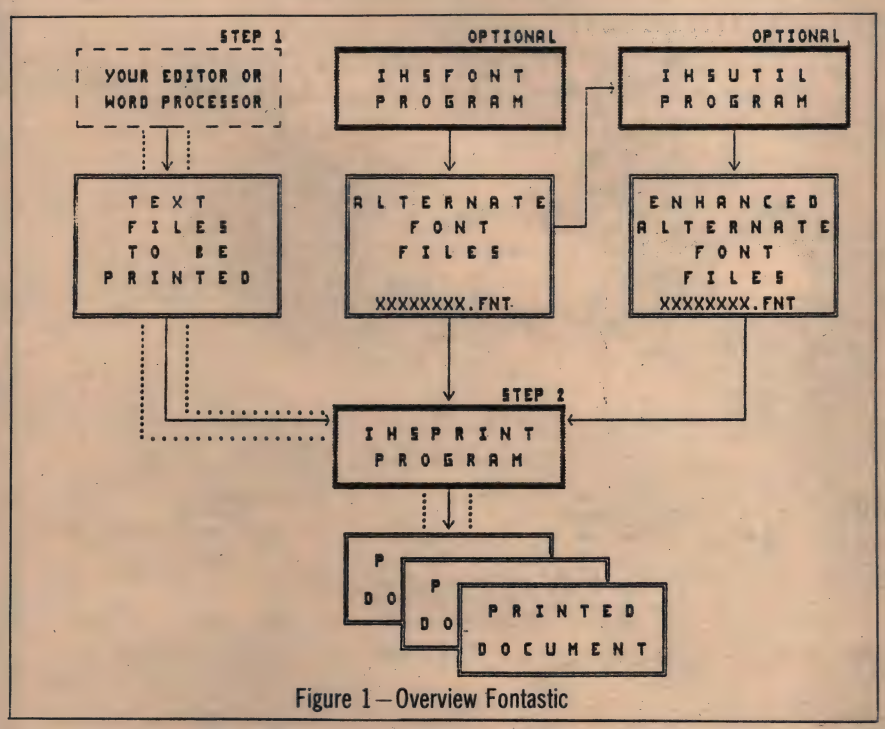

Figure 1—Overview Fontastic

Produced by IHS Systems (4718 Meridian Ave., Suite 211, San Jose, CA 95118, 408/265-5503), this is a comprehensive utility package that will let you access the full potential of your printer. Fontastic allows you to exploit bit-graphic mapping routines to print standard DOS ASCII files in virtually unlimited font variety and elegance!

Figure 1 displays an overview of the program, printed with the program itself, showing all the interconnections and functions. Font styles and sizes are fully controlled by the user, and an infinite number of additional fonts can be created without special skills from a screen blowup of the pixels which, when shrunk back to normal scale, make up a single character.

Fontastic consists of three major parts: IHSPRINT, the printing program, which will print any specified ASCII text file and use the Fontastic text formatting commands to print any font. IHSUTIL, a utility to manipulate your font definition files, performing major "editing" functions. And IHSFONT, character definition editor which allows you to create or change characters.

A set of predefined fonts are included for immediate use: Block, Greek, Stick, Gothic, Special, Striped, Graphics, Dark bold Lettering, Electronic, Light bold, Calligraphy, Typewriter style, and Roman.

As shown in Figure 1, creation of a DOS text file is the first step. This can be done by using one of a number of available editors or word processors. Simply place the special control words in appropriate places, to control formatting, page composition, and font selections. Then save and exit from your word processor. Print using the IHSPRINT command. In this manner, you can control highlighting, shadow-characters, double open characters, the whole gamut of normal print-modes, and the upper reaches of imagination...

IHSFONT is a full-screen character editor. When you want to print all or a portion of your document using an alternate font, you can dynamically load a font file and use it during the printing operation. You can merge portions from one font into another and make font characters proportional.

Fontastic permits you to print characters in various sizes, which are shown in Figure 2. These are categorized by "scale" values, which refers to the size of the dot matrix used in the character definition. The smallest definable character matrix is 8x12 (Scale #1). When

continued on page 354

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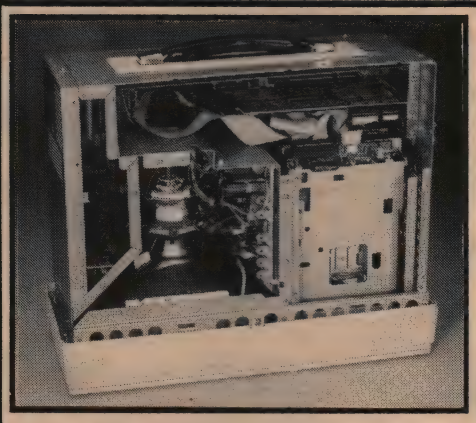

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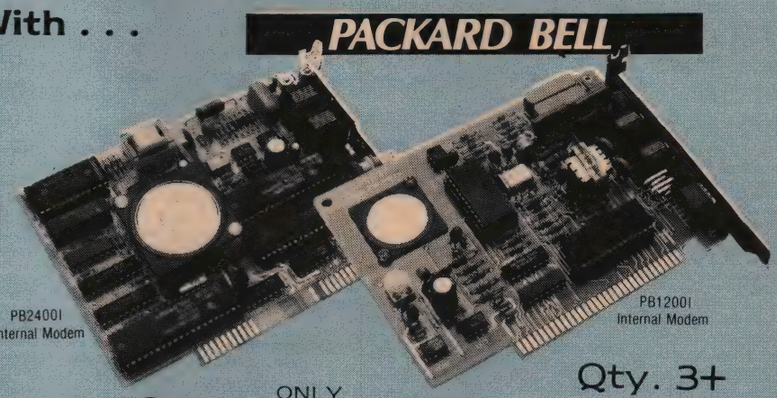

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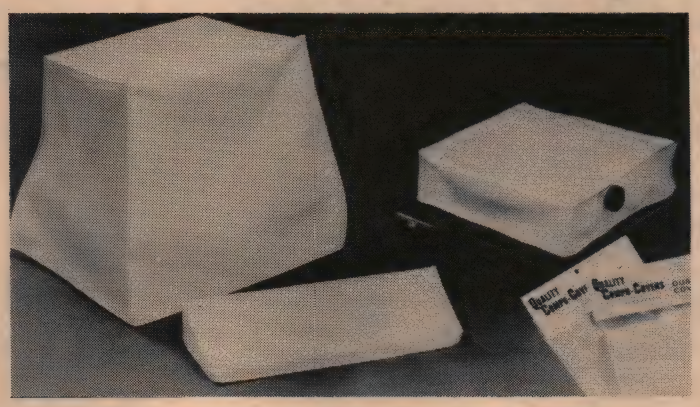

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11-88

Fontastic Is Fantastic
continued from page 351

printed on most 9 (or 8) pin dot matrix printers, this size corresponds to the default size of the printer. A Scale #2 character size would correspond to a double-high/double-wide. Scale #3 (24x36) is a triple-high/triple-wide.

Each character to be displayed on the video display or the printer has a machine "code" associated with that letter/number. This is because computers can only recognize "BINARY" information and must have a "code" in character definition, the American Standard Code for Information Interchange (ASCII) was chosen.

In the ASCII code, the charcter "A" has a decimal numeric value of 65 and the character "B" has a decimal numeric value of 66. Therefore, each character within a font has a value (or code) assigned to it so the computer can recognize it. Fontastic uses these codes to assign a new font definition to a character in the printing font.

For the flavor of the process, here are some examples of the colon commands (and translations) which will be embedded in a text file.

Font Creation

Creating new fonts and editing of the defined fonts is provided via the IHSFONT utility. This utility is unique in its support of simplistic editing of complex characters, with full screen blowups and direct access of pixels. The process uses all function-keys to make it even more convenient. Not all characters of a print set must be defined. That is, if only a few special characters are required in the document, only those special characters must be defined; all others would be the normal defined font set.

The full 255 available ASCII character set is available for definition of new characters, not just the normal printable set of 96 characters, with control of proportional printing, graphics characters, and reverse images. The font definitions are highly compressed into disk files occupying about 2K.

The normal character cell on the supported dot matrix printers is 8x12 dot matrix, but only the 8x9 portion is used in the predefined character set. IHSFONT allows you to define the full character font by specifying which of the printer pins will be activated in printing the defined character in the bit-graphics mode.

Thus, you may define a new character form for each character in the print set or may define completely new characters which occupy the normally non-printable characters in the ASCII set. While editing the definition file, data is keyed into the input "fields" and the appropriate function is initiated by pressing the desired function key.

Larger size characters provide greater printing resolution when using fancy character sets such as the GOTHIC forms. The selectable proportional printing form will result in a near letter quality hard copy from an inexpensive dot matrix printer. Proportional character definition (i.e., variable character width) is supported on the detail screen level.

The user specifies the width of the character via a function key to define the bounds of the character generated. In this manner, the user is in full control of the final format of the character set being generated.

As new characters are added to the specified file, they are appended following the characters already defined. This means that when reviewing a font file, the order in which the characters are displayed is the order in which they were added. Such ordering may be performed by use of the utility program.

Most popular dot-matrix printers are supported, including IBM Graphics Printer, Epson MX-80/100, FX-80/100, C. Itoh 8510A, 8510BPI, Gemini 10x and 15x, OkiData 84 (with APA option), 92/93 (with Plug-N-Play option), Texas Instruments 855, Toshiba 1340/1350/1351, Fujitsu DPL24/DPMG9, Siemens, PT-88, Panasonic KX-P10xx series, CIE 3500 (Model 20), DEC, Star, Mannesmann Tally MT-180, Spirit 80, Citizen, Diablo, etc. Some printers are compatible in the character mode (e.g., italics, underline, etc...) while not in the BIT graphics mode.

Here is another story of a fine software product that began life as a commercial release and then entered the shareware universe. Commercial marketing proved too expensive and the author had other fish to fry; and he had found that it could sell itself. So he invited all and sundry to copy and use his program, hoping that enough would want to pay the modest fee. I don't know if IHS is making any money, but I do know that this is a fantastical set of font tools! You owe it to yourself to try Fontastic. ●

Figure 2—Fontastic's Font Sizes

	9 PIN	24 PIN *
SCALE #1	8 POINTS (1/9" high)	3 POINTS (2/32" high)
SCALE #2	16 POINTS (1/5" high)	6 POINTS (3/32" high)
SCALE #3	24 POINTS (1/3" high)	9 POINTS (4/32" high)

* - When in 24 pin mode (some printers support 8 pin mode)

SPC Announces PFS:First Publisher 2.0

Software Publishing Corporation has announced PFS:First Publisher 2.0, an enhanced version of its best-selling, entry-level desktop publishing program. Retail priced at $129, PFS:First Publisher 2.0 offers all the features of the original version plus easily and quickly imports files from leading word processing packages and is the only entry-level desktop publishing program to accept scanned images.

Version 2.0 supports a host of other new features designed to increase user productivity and enhance creativity. For example, it operates twice as fast as the original version; features on-line help; offers improved output quality on dot matrix and laser printers; supports all HP soft fonts and more dot matrix, laser and inkjet printers than any other entry-level product; enables images to be rotated 90 degrees, and features new speed keys and speed functions.

"PFS:First Publisher 2.0 is the ideal desktop publishing solution for business communicators who want to produce attention-getting memos, newsletters, flyers, announcements or invitations," said Wesley Richards, vice president of marketing and sales. "Unlike its high-end counterparts, PFS:First Publisher 2.0 doesn't require publishing expertise, a substantial investment in learning time or expensive hardware. It's a truly powerful productivity tool for business communicators because it's full featured, easy to use and capable of working with existing hardware and software."

Increased Software/Hardware Connectivity

PFS:First Publisher 2.0 makes it even easier for users to create a variety of professional-quality documents without having to incur costly new software and hardware.

For example, unlike the original version, which only permitted SPC's word processing files and ASCII files to be directly imported, PFS:First Publisher 2.0 enables files from a variety of leading word processing packages to be easily incorporated into a PFS:First Publisher document. Simply by choosing a menu item, users can directly import ASCII, DCA (i.e., Display Write 3 files saved as DCA), MicroSoft Word, MultiMate, PFS:First Choice, PFS:Write, Professional Write, Wang PC, Word Perfect and WordStar files. Version 2.0 also is the only entry-level desktop publishing package to accept scanned images. As a result, users can easily incorporate a variety of images into their document—from line art and corporate logos to signatures.

The new version also supports more than 70 different printers, including 9- and 24-pin dot matrix printers, leading laser printers and inkjet devices, such as HP's DeskJet. PFS:First Publisher 2.0 is the only low-end desktop publishing program to support HP's extensive family of LaserJet soft fonts (and 100% compatible fonts, such as those offered by Bitstream), and built-in fonts for dot matrix printers.

The program features 300 dpi resolution for text on laser printers with laser fonts. Its proprietary print-smoothing algorithm creates the highest resolution dot matrix output available. One hundred and fifty clip art images and a selection from the 150 available fonts are included with PFS:First Publisher 2.0. Additional clip art portfolios and fonts are available separately. In addition, a virtually limitless variety of clip art images and fonts can be imported to PFS:First Publisher 2.0 giving users a wide variety of design options.

Increased Performance

PFS:First Publisher 2.0 now performs most functions, such as importing text, manipulating images and printing more than twice as fast as the original version. Also, its new speed keys enable users familiar with the program to bypass menus and new speed functions enable users without a mouse to move more quickly and easily about the screen.

To help new users easily master the program and more practiced users easily find quick answers to occasional questions, PFS:First Publisher 2.0 features a mini, on-line manual. It is the only leading desktop publishing program to offer on-line help. Unlike most high-end packages which typically require days or weeks of use to master the basic capabilities, most PFS:First Publisher users can produce a document within their first several hours using the software.

Increased Design Flexibility

PFS:First Publisher 2.0 offers a number of new features that greatly expand users' design options. For example, it is the only entry-level package that enables words and graphics to be rotated 90 degrees. Now users can position mastheads horizontally or change the look of clip art images. To simplify design, PFS:First Publisher also includes

continued on page 357

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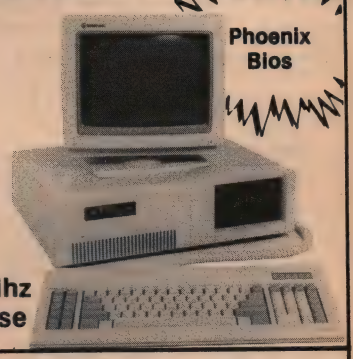

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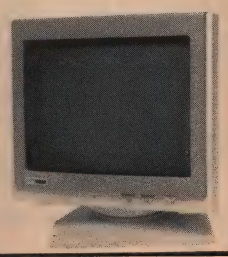

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A Jingle In Your BASIC

by William McMullan

I have seen many programs that started with a jingle. Most of them are simple arrangements like *Mary Had A Little Lamb*, played off key. The program I will describe creates data statements that may be included into your BASIC or compiled BASIC programs. It allows you to take a piece of music and key in the notes in the proper manner.

What I have attempted to do with this program is to, as simply as possible, transcribe sheet music into BASIC. It will not take the place of the more expensive programs that allow you to compose music. I never meant it to do that.

I don't claim to know much about music, so bear with me. If I use the wrong terminology just try to figure out what I am trying to say. If you know nothing about music then we are in good shape.

This program writes a data file that is merged with the program in Listing 2, to create a sub-routine or a stand-alone BASIC program. I have attempted to use the standard format for music in BASIC. Look in your BASIC manual under PLAY for additional information.

I will attempt to give a brief description in Figure 1.

This is most of the commands, there are a few others that I didn't use in the program. Most do the same thing these do except in a different way.

You won't have to learn these commands, the program will take care of that task for you.

JINGLE	
A-G	Notes
+/-	Sharp and Flat
L(n)	Sets length of note, 1=whole, 2=half, 4=quarter, etc.
MN	Music Normal—Each note plays 7/8 of a period.
ML	Music Legato—Each note plays a full period.
MS	Music Staccato—Each note plays 3/4 of a period.
O(n)	Octave number—Middle C is the beginning of octave number 3.
P(n)	Pause (n) can be 1 to 64
T(n)	Sets the Tempo
.(period)	Used to increase the length of a note

Figure 1

How The Program Works

Lets look at the program flow. In line 90 we gosub to 1590, which is our routine for the opening screen. In line 1600 we gosub to 1480 which is a box drawing routine. Also in line 1600 the RR, CC, R1 and C1 which corresponds to depth, width and R1/C1 is the top left corner of the box. The box routine will be used again by changing these values. See Listing 1, page 358 and 360.

Here is a hint on creating the opening graphics screen. From the Ok prompt in BASIC, type KEY 1,CHR$(219) press enter now type KEY 2, CHR$(177) and press enter. Use the f1 and f2 keys to draw the graphics into your program listing.

While the Opening screen is being displayed, we get a sample of the music we can create by doing a gosub to line 1790. This sub-routine is similar to the program that we will create later. We are allowed to terminate the opening music early with any keystroke in line 1810.

Now we should be in the work area of the program, lines 220 through 640 set up the work screen. Using the arrow keys and several others we can create each note by just moving the different cursors on the screen.

Lines 650 through 1010 keep up with our cursors on the screen. The row positions of the different cursors are used in the variables to determine what we want to do.

As you can see in lines 1020 through 1360, using If statements we set up note lengths, duration etc. Line 1260 is used to determine which octave and which note we wish to use. We pick the notes by moving three characters at a time. This is set up in line 1250 by making N = three times the row position and then moving back two spaces. Still a little hazy? Let's take a closer look. Note

continued on page 357

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A Jingle
continued from page 356

O4G is the highest note that we are going to use. It will be the top note on our screen, and is located in Row 1. Now some simple math in line 1250. Three times one(row) equals three and subtract two, we get 1. Right? Now take a look at the midstring statement in line 1260. We want the three characters beginning at the "N"th position. We just determined that to be one. O4G right? Look again, suppose our cursor was on the second line. 2x3 = 6 and 6 – 2 = 4, from position 4 using three characters we get O4F. Now you're cooking.

Once we have determined which octave we are in, there is no need to declare it with each note played in the same octave. That would only serve to eat up memory. So in line 1270 we strip off the excess baggage. The same applies to note length and duration, these are taken care of in lines 1120 and 1190 in a similar fashion.

Line 1290 concatenates our different parts of our note and saves it in NOTE$. If you elect to just listen to a note by pressing "L" then the note is not saved, but if you press the enter key, our program gosubs to line 1380. Here we will create data statements.

Upon completion of our input you will want to write your music to disk. Pressing "W" sends the data statements to disk through the routine in line 1420-1470.

Using The Program

OK, you folks that read music go to work and transcribe some music. You folks that don't, read on. Now, I am no music teacher, and by no means a musician, so what I have to say will be in the simplest terms.

At the top of the music sheet, if you see the word legato, or the word staccato use the "M" key and select the proper note duration.

The position of the cursor on the left is going to change our notes. Low notes at the bottom and high ones at the top. Look at the music you want to transcribe and set this cursor in the same position as the note you want to enter. The up and down arrow keys control this cursor.

Now we need to set the length of the

continued on page 358

PFS:First
continued from page 355

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Like the original version, documents can be formatted in one- to four-column layouts of equal or different widths. Even within a multi-column format, users can place graphics anywhere on a page or run text completely across a page any place on the page.

Unique in its category, PFS:First Publisher can take a screen shot of any screen image and import it, plus with the program's magnify mode, users can enlarge and perfect graphics images (a feature called fat-bit editing). PFS:First Publisher also imports graphics files, such as PC Paintbrush (.PCX) and Microsoft Windows Paint (.MSW). Users can resize, rotate, invert, or flip graphics to enhance their design. The base package supports Apple Laser Writer, Postscript and Hewlett-Packard LaserJet printers and included in the program, 150 clip art images and 60 fonts.

Add-On Art

To meet specific budget and application needs, the PFS:First Publisher base product offers a wide sample of fonts and clip art. Two additional fonts and seven clip art portfolios are available.

Listing for $39 each, nine add-on portfolios also are available including two new art packages: Christian Symbols and Just For Grins. The other art portfolios are Business Symbols, Leisure and Lifestyles, Publications, Holidays and Personal Graphics. Decorative Fonts and the Executive Font Collection offer additional large-size fonts. All versions of the product and add-on portfolios are compatible with one another.

Availability And System Requirements

PFS:First Publisher 2.0 is priced at $129. Existing users can receive an upgrade for $35 until September 30, 1988. PFS:First Publisher 2.0 supports EGA, CGA and Hercules graphics cards. The program requires 512K of memory and runs on IBM PC, XT, AT PS/2 and 100% compatible computers.

For more information contact SPC Software Publishing, 1901 Landings Drive, Mountain View, California 94039; 415-962-8910. ●

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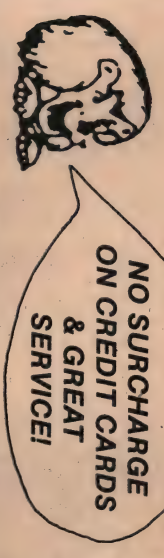

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A Jingle
continued from page 358

note. Using left and right arrow keys moves this cursor. Select whole, half, quarter etc. You say you want to know what is a whole note. Right? OK, I will try to describe the different notes in Figure 2.

And you thought reading music was hard.

If the note has a dot associated with it press the period key. If it has two dots press the period key twice.

If the note has a "#" next to it then that note is said to be a sharp. If it has a symbol that looks like a little "b" then it is a flat. You will use the Home key to make this selection. A rest or pause is a bar on the music sheet, press the "P" key for a pause.

Look at the beginning of the first line of music. If you see sharp or flat symbols, then each time you encounter a note located on the same line then it means that note automatically takes on the sharp or flat.

One thing I included that I haven't covered yet is the "B" key to indicate the end of a bar. That's a thin vertical line on the music. I included this just to make editing notes easier to find. All it does is place two spaces into our data statements. If you use it or not it will make no difference.

Press the "ENTER" key after each note. If at any time you want to just listen to a note then press the "L" key to listen to the note. When you have completed the music then press the "W" key. This will save the data in BASIC data statements ready to merge into our Music Loader program. The name of the data file is NEWSONG.DAT.

Whole Note	Looks like a "O"
Half Note	Looks like a "O" with a handle, or a balloon on a stick
Quarter Note	Looks like a black balloon on a stick.
Eight Note	Same as above but with a flag tied to the stick.
Sixteenth Note	as above with two flags.
1/32, 1/64, etc., etc.	

Figure 2

Now load the music loader program from Listing 2 (page 360). Its name is MUSICLDR.BAS. Run the program, it instructs you to press key 5 and press enter. Line 5 in the program has just been erased from memory, but it has already done its work. It just merged the data file and created a new program. Now you will want to save this new routine to a new filename. Use the name of the song or as close to it that 8 characters will allow and use the .BAS extension. Now run the program, how about that, music from a computer, what will they think of next?

About editing, use any word processor as long as it will save in ASCII, or you can edit it from BASIC. This is probably the way you will want to do it so that you can run it and see if it sounds right.

When you have the jingle perfected use a sub-routine like the one in line 1790-1850 and include the data statements into your program. Don't forget to renumber the lines to fit into your main program.

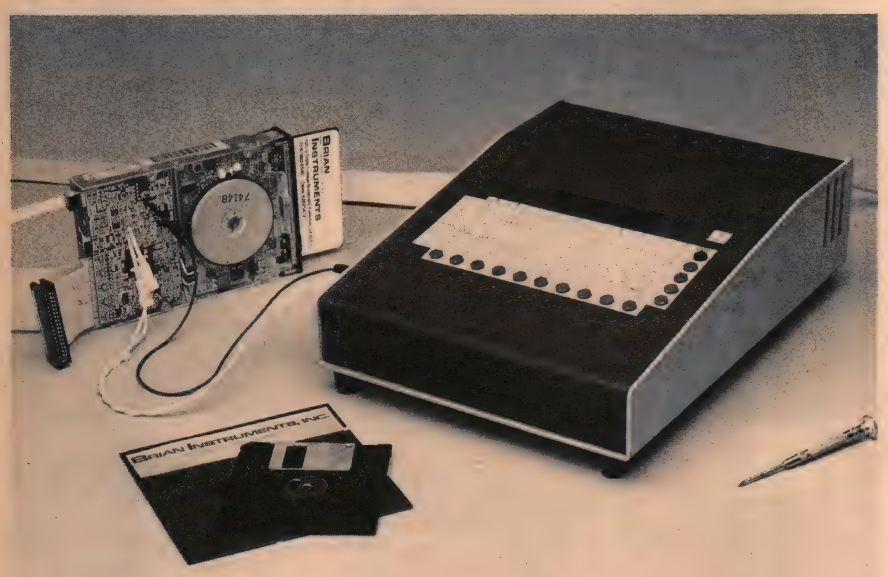
Finish

Now when you add that jingle to that game program, *Mary Had A Little Lamb* won't sound like *London Bridges*. ●

Listing 1

```
10 ' -- File name JINGLE.BAS -- Ver. 1.0  03/24/88
20 ' Written by  William McMullan
30 '             Rt 6 Box 1
40 '             Bastrop, La. 71220
50 DEFINT A-Z
60 CLS
70 ON ERROR GOTO 1550
80 KEY OFF:YY=90:DIM DAT$(500)
90 GOSUB 1590
100 '---------------- PRINT MENU ----------------------
110 RR=13:CC=35:R1=12:C1=43:GOSUB 1480
120 LOCATE 13,35:PRINT"KEY USAGE"
130 LOCATE 15,46:PRINT"Notes      <Up/Down> Arrow Keys"
140 LOCATE 16,46:PRINT"Sharp/Flat          <Home> Key"
150 LOCATE 17,46:PRINT"Note Length   <R/L> Arrow Keys"
160 LOCATE 18,46:PRINT"Doted Note        <Period> Key"
170 LOCATE 19,46:PRINT"Normal/Legato/Staccato <M> Key"
180 LOCATE 20,46:PRINT"Listen to one note press   <L>"
190 LOCATE 21,46:PRINT"Pause  <P>         End Bar  <B>"
200 LOCATE 22,46:PRINT"To save a Note Press   <ENTER>"
210 LOCATE 23,46:PRINT"Write File <W>       Quit <ESC>"
220 '---------------- PRINT WORK WINDOW ---------------
230 LOCATE 1,1,0:PRINT "  G"
240 LOCATE 2,1:PRINT "F   ";CHR$(214);STRING$(10,196)
250 LOCATE 3,1:PRINT "  E ";CHR$(186);STRING$(10," ")
260 LOCATE 4,1:PRINT "D   ";CHR$(199);STRING$(10,196)
270 LOCATE 5,1:PRINT "  C ";CHR$(186);STRING$(10," ")
280 LOCATE 6,1:PRINT "B   ";CHR$(199);STRING$(10,196)
290 LOCATE 7,1:PRINT "  A ";CHR$(186);STRING$(10," ")
300 LOCATE 8,1:PRINT "G   ";CHR$(199);STRING$(10,196)
310 LOCATE 9,1:PRINT "  F ";CHR$(186);STRING$(10," ")
320 LOCATE 10,1:PRINT "E   ";CHR$(211);STRING$(10,196)
330 LOCATE 11,1:PRINT "  D"
340 LOCATE 12,1:PRINT "C"
350 LOCATE 13,1:PRINT "  B"
360 LOCATE 14,1:PRINT "A   ";CHR$(214);STRING$(10,196)
370 LOCATE 15,1:PRINT "  G ";CHR$(186);STRING$(10," ")
380 LOCATE 16,1:PRINT "F   ";CHR$(199);STRING$(10,196)
390 LOCATE 17,1:PRINT "  E ";CHR$(186);STRING$(10," ")
400 LOCATE 18,1:PRINT "D   ";CHR$(199);STRING$(10,196)
410 LOCATE 19,1:PRINT "  C ";CHR$(186);STRING$(10," ")
420 LOCATE 20,1:PRINT "B   ";CHR$(199);STRING$(10,196)
430 LOCATE 21,1:PRINT "  A ";CHR$(186);STRING$(10," ")
440 LOCATE 22,1:PRINT "G   ";CHR$(211);STRING$(10,196)
450 LOCATE 23,1:PRINT "  F";
460 LOCATE 24,1:PRINT "E  ";
470 LOCATE 3,30:PRINT "  WHOLE"
480 LOCATE 4,30:PRINT "  HALF"
490 LOCATE 5,29:PRINT CHR$(219);"  QUARTER          "
500 LOCATE 6,30:PRINT "  EIGHTH"
510 LOCATE 7,30:PRINT "  SIXTEENTH"
520 LOCATE 8,30:PRINT "  1/32"
530 LOCATE 9,30:PRINT "  1/64"
540 LOCATE 12,29:PRINT CHR$(219);"  NORMAL"
550 LOCATE 13,30:PRINT "  SHARP"
560 LOCATE 14,30:PRINT "  FLAT"
570 LOCATE 3,58:PRINT CHR$(219);" NORMAL"
580 LOCATE 4,60:PRINT "DOTTED"
590 LOCATE 5,60:PRINT "DOUBLE DOTTED"
600 LOCATE 8,58:PRINT CHR$(219);" NORMAL"
610 LOCATE 9,60:PRINT "LEGATO"
620 LOCATE 10,60:PRINT "STACCATO"
630 LOCATE 17,32:PRINT "PAUSE"
640 LOCATE 19,32:PRINT "ENDofBAR"
650 '------------------ INPUT -------------------------
660 S=12:M=8:C=10:R=12:D=5:DD=3:LOCATE R,C:PRINT CHR$(219);
670 A$="":WHILE A$="":A$=INKEY$:WEND
680 LOCATE R,C
690 IF A$=CHR$(0)+"H" THEN 700 ELSE 720
700 R=R-1:IF R<1 THEN R=24
710 IF R MOD 2 THEN PRINT CHR$(196);ELSE PRINT " ";
720 IF A$=CHR$(0)+"P" THEN 730 ELSE 750
730 R=R+1:IF R>24 THEN R=1
740 IF R MOD 2 THEN PRINT CHR$(196);ELSE PRINT " ";
750 IF A$=CHR$(0)+"K" THEN LOCATE D,29:PRINT " ";:GOTO 760 ELSE 780
760 D=D-1:IF D<3 THEN D=9
770 LOCATE D,29:PRINT CHR$(219);
780 IF A$=CHR$(0)+"M" THEN LOCATE D,29:PRINT " ";:GOTO 790 ELSE 810
790 D=D+1:IF D>9 THEN D=3
800 LOCATE D,29:PRINT CHR$(219);
810 IF A$="." THEN LOCATE DD,58:PRINT " ";:GOTO 820 ELSE 840
820 DD=DD+1:IF DD>5 THEN DD=3
830 LOCATE DD,58:PRINT CHR$(219);
840 IF A$="M" OR A$="m" THEN LOCATE M,58:PRINT " ";:GOTO 850 ELSE 870
850 M=M+1:IF M>10 THEN M=8
860 LOCATE M,58:PRINT CHR$(219);
870 IF A$=CHR$(0)+"G" THEN LOCATE S,29:PRINT " ";:GOTO 880 ELSE 900
880 S=S+1:IF S>14 THEN S=12
890 LOCATE S,29:PRINT CHR$(219);
900 IF A$=CHR$(13) THEN GOSUB 1020
910 IF A$="W" OR A$="w" THEN GOSUB 1420
920 IF A$=CHR$(27) THEN COLOR 7,0:CLS:END
930 IF A$="L" OR A$="l" THEN L=1:GOSUB 1030
```

continued on page 360



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Listing 1 continued from page 358

```
940 IF A$="P" OR A$="p" THEN IF P=0 THEN P=1 ELSE P=0
950 IF P=0 THEN LOCATE 17,29:PRINT " "
960 IF P=1 THEN LOCATE 17,29:PRINT CHR$(219)
970 IF A$="B" OR A$="b" THEN IF B=0 THEN B=1 ELSE B=0
980 IF B=0 THEN LOCATE 19,29:PRINT " "
990 IF B=1 THEN LOCATE 19,29:PRINT CHR$(219)
1000 LOCATE R,C:PRINT CHR$(219);
1010 GOTO 670
1020 '---------------------- CREATE THE NOTE ----------------------
1030 'R=THE NOTE   D=DURATION   DD=DOTTED NOTE   S=NORMAL/SHARP/FLAT
1040 'M=NORMAL/LAGATO/STACCATO
1050 IF D=3 THEN XD$="L1"
1060 IF D=4 THEN XD$="L2"
1070 IF D=5 THEN XD$="L4"
1080 IF D=6 THEN XD$="L8"
1090 IF D=7 THEN XD$="L16"
1100 IF D=8 THEN XD$="L32"
1110 IF D=9 THEN XD$="L64"
1120 IF XD$=LD$ THEN D$="" ELSE D$=XD$:LD$=XD$
1130 IF S=12 THEN S$=""
1140 IF S=13 THEN S$="+"
1150 IF S=14 THEN S$="-"
1160 IF M=8 THEN XM$="MN"
1170 IF M=9 THEN XM$="ML"
1180 IF M=10 THEN XM$="MS"
1190 IF XM$=LM$ THEN M$="" ELSE M$=XM$:LM$=XM$
1200 IF DD=3 THEN DD$=""
1210 IF DD=4 THEN DD$="."
1220 IF DD=5 THEN DD$=".."
1230 IF P THEN NOTE$=M$+D$+"P1":GOTO 1300
1240 IF B THEN NOTE$="  ":GOTO 1310
1250 N=3*R-2
1260 XN$=MID$("O4GO4FO4EO4DO4CO3BO3AO3GO3FO3EO3DO3CO2BO2AO2GO2FO2EO2DO2CO1BO1AO1
GO1FO1E",N,3)
1270 IF LEFT$(XN$,2)=LEFT$(LN$,2) THEN N$=RIGHT$(XN$,1) ELSE N$=XN$
1280 LN$=XN$
1290 NOTE$=M$+D$+N$+S$+DD$:LOCATE 23,22:PRINT NOTE$+"          ";
1300 IF P THEN LOCATE 23,25:PRINT "PAUSE":P=0
1310 IF B THEN LOCATE 23,25:PRINT "ENDofBAR":B=0
1320 IF L THEN PLAY NOTE$ : L=0 : GOTO 1340
1330 IF NOT L THEN PLAY NOTE$ : GOSUB 1380
1340 LOCATE 8,29:PRINT " ":S=12:LOCATE 12,29:PRINT CHR$(219)
1350 LOCATE DD,58:PRINT " ":DD=3:LOCATE 3,58:PRINT CHR$(219)
1360 RETURN
1370 '---------------- CREATE DATA STATEMENTS ----------------
1380 J=J+1:IF J>20 THEN J=1:X=X+1
1390 DAT$(X)=DAT$(X)+NOTE$
1400 RETURN
1410 '---------------- WRITE ROUTINE  ----------------
1420 OPEN "NEWSONG.DAT" FOR OUTPUT AS #1
1430 FOR XX=0 TO X
1440 YY=YY+10
1450 PRINT #1,STR$(YY)" DATA "DAT$(XX)
1460 NEXT XX
1470 CLOSE:RETURN
1480 '---------------------- PRINT BOX ----------------------
1490 CLS
1500 LOCATE R1,C1:PRINT CHR$(201);:PRINT STRING$(CC-2,205);:PRINT CHR$(187);
1510 FOR RX=1 TO RR-2:LOCATE R1+RX,C1:PRINT CHR$(186);:LOCATE R1+RX,C1+CC-1:PRIN
T CHR$(186);
1520 NEXT
1530 LOCATE R1+RX,C1:PRINT CHR$(200);:PRINT STRING$(CC-2,205);:PRINT CHR$(188);
1540 RETURN
1550 '---------------- ERROR ROUTINES ----------------
1560 IF ERL=1320 OR ERL=1330 THEN LOCATE 23,25:PRINT "NOT LEGAL":RESUME 1340
1570 PRINT "ERROR "ERR" IN LINE "ERL
1580 END
1590 '---------------------- OPENING SCREEN ----------------------
1600 COLOR 14,1:RR=24:CC=80:R1=1:C1=1:GOSUB 1480
1610 LOCATE  3,18:PRINT"
1620 LOCATE  4,18:PRINT"
1630 LOCATE  5,18:PRINT"
1640 LOCATE  6,18:PRINT"
1650 LOCATE  7,18:PRINT"
1660 LOCATE  8,18:PRINT"
1670 LOCATE  9,18:PRINT"
1680 LOCATE 10,18:PRINT"
1690 LOCATE 13,15:PRINT"
1700 LOCATE 14,15:PRINT"
1710 LOCATE 15,15:PRINT"
1720 LOCATE 16,15:PRINT"
1730 LOCATE 17,15:PRINT"
1740 LOCATE 18,15:PRINT"
1750 LOCATE 19,15:PRINT"
1760 LOCATE 20,15:PRINT"
1770 LOCATE 22,30:PRINT"by William McMullan"
1780 GOSUB 1790:RETURN
1790 PLAY"MBL16T155"
1800 FOR I=1 TO 20
1810  READ M$ : IF INKEY$<>"" THEN 1840
1820  PLAY M$
1830 NEXT I
1840 IF PLAY(0)=0 THEN 1850 ELSE 1840
1850 RETURN
1860 DATA "p8mso1bbb8bbb8bbo2e8f#8g#8o1bb
1870 DATA "b8bbo2e8g#g#f#8d#8o1b8bbb8bb
1880 DATA "b8bbo2e8f#8g#8eg#mlb4bmsag#f#
1890 DATA "e8g#8e8o3bbb8bbb8bbo4e8f#8
1900 DATA "g#8o3bbb8bbo4e8g#g#f#8d#8o3b8bb
1910 DATA "b8bbb8bbo4e8f#8g#8mleg#b4
1920 DATA "bag#f#mse8g#8e8o3g#g#g#8g#g#g#8g#g#
1930 DATA "g#8o4c#8o3g#8o4c#8o3g#8o4c#8o3g#8f#8e8d#8
1940 DATA "c#8g#g#g#8g#g#g#8g#g#g#8o4c#8o3g#8o4c#8
1950 DATA "o3g#8o4c#8o3b8a#8b8a#8b8g#g#g#8g#g#
1960 DATA "g#8g#g#g#8o4c#8o3g#8o4c#8o3g#8o4c#8o3g#8f#8
1970 DATA "e8d#8c#8g#g#g#8g#g#g#8g#g#g#8o4c#8
1980 DATA "o3g#8o4c#8o3g#8o4c#8o3b8a#8b8o2bbb8f#f#
1990 DATA "f#8f#f#f#8g#8a8f#4mna8msg#8mne4
2000 DATA "msg#8f#8f#8f#8o3f#f#f#8f#f#f#8g#8
2010 DATA "a8mnf#4msa8g#8mne4msg#8f#8o2bb
2020 DATA "b8o1bbb8bbb8bbo2mne8f#8g#8o1bb
2030 DATA "b8bbo2e8g#g#f#8d#8o1b8bbb8bb
2040 DATA "b8bbo2e8f#8g#8eg#mlb4mnbag#f#
2050 DATA "e8g#8e8
```

MUSIC MAKER

Listing 2

```
5 CLS:PRINT "At the Ok prompt, type '5' and press <ENTER>."CHR$(13)"Type  SAVE "
CHR$(34)"filename.BAS"CHR$(34);CHR$(13)"Then type RUN and Press <ENTER>.":MERGE
"newsong.dat"
10 CLS:KEY OFF
15 ON ERROR GOTO 9000
20 INPUT "Enter Tempo (32-255)";T:IF T<32 OR T>255 THEN T=130
25 PLAY "MBT"+STR$(T)
30  READ M$
35  PRINT M$
40  PLAY M$
45 GOTO 30
50 IF PLAY(0)=0 THEN 60 ELSE 50
55 END
60 FOR I=1 TO 5000:NEXT I:GOTO 55
9000 IF ERL=30 THEN RESUME 50
9010 PRINT "ERROR "ERR" IN LINE "ERL:END
```

Quick & Easy Mailmaster For The PC

by Fred Blechman

Ever since I started using a microcomputer, I've been looking for a mailing list program with some powerful features—but doesn't take a lot of time to learn to use. Quick & Easy Mailmaster, a new $39.95 program, looks like what I've been seeking.

This program is not yet well-known, since it has only enjoyed exposure through modest advertising and some news releases. The present version works well, but lacks some convenience features. According to the author, Al Willis, a manual and forthcoming revision will implement many user suggestions and add several new features.

Background

During the years I used my TRS-80 Model I and III, I wrote my own mailing list program to print address labels 3-across on Radio Shack label stock. It was written in BASIC and had practically no features. It had no search or sort capabilities, and did not even include phone numbers. In order to add, delete, change or rearrange names and addresses, you had to know a little bit about BASIC programming.

I tolerated these shortcomings for two reasons: (1) I didn't really need any other features, and (2) I didn't know how to program anyhow. In other words, I learned to live with my own level of incompetence!

I looked at various mailing list programs for those machines and found the programs difficult to learn and use. The very features that added to their power were often the causes of catastrophic crashes. I found little flexibility in use, and was confined to the existing programming—which was too advanced for me to fathom or modify. So I continued to use my own 3-Across Labels.

Sanyo/IBM PC Upgrade

Several years ago I bought a Sanyo MBC 550, which is still my favorite micro (although hardly ever used anymore). This expanded my software horizon to include programs written for the MSDOS world. Unfortunately, most of these were written for the IBM PC, and the Sanyo, although MSDOS compatible, was not very IBM PC compatible due to a different keyboard and much different screen addressing.

Nevertheless, I kept my eyes open for a mailing list program that might suit my modest needs. I only keep a few hundred names in my mailing list, and I only update the list about every six months, so I didn't want a program I would have to relearn every time. I wanted to print three labels across, since I had a lot of those blank labels, and I find this the fastest and most convenient label format. Also, if possible, I wanted to be able to use my existing list by transporting it somehow into the new program.

Although I'm certain there must be a simple yet powerful mailing list program out there somewhere for my Sanyo, I never found it. The ones I looked at were gross overkill for my needs. So I simply modified my TRS-80 BASIC program for the Sanyo, without adding any features.

When I finally upgraded to an IBM PC/XT, I was sure that I'd find what I was looking for. However, the closest I'd come (before Quick & Easy Mailmaster) was Avery's List&Mail, which I reviewed for *Computer Shopper* in the February 1988 issue (starting on page 260). I thought it was pretty good, and I'd still recommend it for someone with a large, frequently-used mailing list and the need to customize printer output. However, be prepared to spend several hours learning to use it.

Unfortunately, List&Mail would not electronically import the data from my own label program. I would have had to retype all the information into List&Mail. So, once again I made a few simple changes to my Sanyo 3-Across Labels BASIC program to allow it to work on the IBM PC and lived with the restricted capabilities.

Quick & Easy

I recently spotted a news release describing the Quick & Easy Mailmaster program. It sounded good, and the low price of $39.95 attracted me. I've come to believe that any program that costs under $50 is more likely to please me than one over $100.

I guess the thing that impresses me most with Quick & Easy Mailmaster (which I'll henceforth refer to as Q&E) is its relative simplicity doing all the things it does. I found some weaknessess you might not be able to live with, but there were certainly more benefits than disadvantages.

Q&E lets you fill in information (called "fields") well beyond the typical first name, last name, street address, city, state and zip code. It allows you to create a mini-database since it includes fields for two phone numbers, a company name, next contact date, two types of search or sort codes, and up to 228 characters of "comments." This makes the program great for keeping track of clients, customers, and prospects, with enough detail to trigger your memory, and a next contact date for follow-up.

Once you've created a "file" consisting of various "records" each made up of the many available fields, you can add, delete or edit any file and then scan, sort and search records within a specified file. You can even combine files.

You can print out address information on labels up to five across, or rotary index cards, postcards or envelopes. You can also print out a telephone list or master file listing.

Using Q&E

To illustrate the simplicity of this program, the complete documentation is

continued on page 362

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Quick & Easy
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printed on two sides of a diskette-sized card that's included with the program disk. This covers system requirements, hard disk or floppy installation, starting Q&E, file naming convention and printer output specifications for labels, cards, envelopes and lists.

While this was adequate, I would like to see an explanation of some other things, as I'll explain further. I contacted the author to find out about the things that I was uncertain about, and he tells me they will be included in a short manual to be provided with the next revision, due out soon.

You probably won't need any special equipment for Q&E, since it will run with an IBM PC/XT/AT or true compatible with two 360K floppy drives or a hard disk, with DOS 2.0 or higher, 296K of RAM, and any printer with at least 80 columns.

I used a standard speed 4.77MHz PC/XT with both Hercules and CGA boards, with both TTL monochrome and RGB color monitors. There is no hard disk in this system, so Q&E was operated using two 360K floppy drives. Color is not required, but is very attractive and readable using a green border and white text on a blue background; prompts are black text on a green background.

Q&E is normally provided on a 360K 5¼" diskette. If you want a 3.5" microdiskette, add $3. If you already have the original 5¼" diskette, return it with $3 and it will be returned with a 3.5" microdiskette. The Q&E diskette is not copy protected, and you start by making a back-up copy to use as a working diskette.

Installation is very simple following the brief instructions, and is carried out by batch files on the diskette. Although not made very clear by the brief instructions for floppy installation, you need to put a formatted disk in Drive B to hold all program data.

Q&E doesn't seem to like some resident programs in RAM. At least, when I used FlickerFree, the Q&E monochrome screens were all messed up, although color was okay. I simply used Ctrl C to interrupt my AUTOEXEC.BAT file that normally loads FlickerFree, and had no further problem.

I also found, if DEVICE = ANSI.SYS was part of my CONFIG.SYS file on boot-up, that I could simply type CLS and press Enter (while in DOS) to clear the screen before starting Q&E in monochrome, and the screens were okay even with FlickerFree resident.

Once you go past a couple of identification and information screens, you get to the Main Menu, Figure 1. The first thing to do is create a new data file. Select A from the Main Menu and you see a screen with the directory of the disk in Drive B (very handy!), and a place for you to name the new file. After confirming the name, you are presented with the Data Input Screen, Figure 2 on page 363. Fifteen fields are shown, any of which you can leave blank.

Unfortunately, there is no way to tell from this entry template the number of characters allowed in each field. There should be reverse-video highlighting to show each field length. Instead, the computer beeps when you have entered the last permitted character, and then moves the entry cursor to the next field. Oddly, reverse-video highlighting is provided when editing a record of an existing file, but not when originating a new record. I'm sure this oversight will be corrected.

Most of the entry titles are obvious,

continued on page 363

```
                    08/07/88
        ----------------------------------
        !    MAILMASTER MENU              !
        ----------------------------------

        Press the Letter that Precedes Your Selection !!!
        =================================================

A. >>  CREATE A NEW DATA FILE              G. >>  PRINT MENU
B. >>  ADD RECORDS TO A DATA FILE          H. >>  SINGLE ENVELOPE OR CARD
C. >>  EDIT A RECORD                       I. >>  SEARCH A DATA FILE
D. >>  DELETE A RECORD                     J. >>  COMBINE TWO DATA FILES
E. >>  SCAN A DATA FILE                    K. >>  UTILITIES MENU
F. >>  SORT A DATA FILE                    Q. >>  QUIT TO OPERATING SYSTEM
                          ----------------------
                          !  SELECTION :       !
                          ----------------------
```

Figure 1—The Main Menu shows most of the functions.

microcomputer

disk drives

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Quick & Easy
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but a few are not explained. Block # refers to the house number, such as the "12345" in "12345 Main Street." Plus 4 refers to the optional additional four characters after the regular Zip code. Code and Cycle provide search and sort codes for you to use as you like. Code allows 7 characters, Cycle allows 8.

You use the Enter and up and down arrow keys to position the cursor at the beginning of any field, and then enter data or edit that field. The Comments field holds 228 characters (almost three screen lines) of continuous text, without word-wrap. That is, when the end of each of the first two comment lines are reached, the next character is put on the next line, even if the word is not complete.

You are given an opportunity to close the file after each record. According to my calculations, if you are using a 360K floppy data diskette in Drive B, you will only be able to hold about 400 records in a file. Each record appears to use about 447 bytes, and there are 362,496 bytes available on a 360K formatted diskette. That would seem to leave room for about 800 records, but when you Sort a file, another file of the same length is created on the disk! With a hard disk drive, you are limited by your available space. Assume you'll need 900 bytes per record, including the occasional sorting function, and you can estimate the record capacity.

Once you've created a file, you can Scan it. After giving the computer the name of the desired file and verifying the name, you get a screen that tells you the number of records in the file, and asks for the starting record number. You can then scan forward or backward, one record at a time, from that starting number. The program flips through records very quickly, presenting the full entry screen for each record.

Adding, editing and deleting files are easily and quickly performed. The procedures for most functions are very similar. Once you learn that the Enter and up and down arrow keys move the cursor around the screen, the rest is almost intuitive. Error trapping is good.

Sorting is slow on a floppy system, but very flexible. You can sort on most of the fields except, of course, Comments. For some strange reason you cannot sort on the company name or the phone numbers. You get to select both a Major and Minor sort field, but can only sort in ascending order.

I sorted a file with 204 records and it took 2 minutes and 35 seconds—not very quick for a program called Quick & Easy. However, I'm told by the author (who offers six months of free telephone support) that this would only take about 20 seconds with a hard disk.

The Search function is very flexible. It allows you to use any field, and not specific to upper or lower case. Furthermore, you do not need to use the entire field. For example, in the last name field, BLEC or Blec will still find Blechman. I was disappointed, however, that once a single search in a file is completed, you cannot search for another name in the same file without going back through the Main Menu. This is one of the things being changed in the next revision.

Printing is straightforward from a Print Menu. No particular printer is specified, except that it must print at least 80 characters on a line. I used an Epson LX-800 with no problems.

You can print 1, 2, 3, 4, or 5 labels across on standard-size label stock. However, not all label widths are supported, and some require the right answers to the questions asked. For ex-

continued on page 364

```
FILE : LIST1                    08/07/88                    RECORD :

                          Data Input Screen
                          =================

FIRST NAME :                          LAST NAME :

BLOCK # :                             STREET :

CITY :                          STATE :          ZIP :          PLUS4 :

HOME PHONE : (   )   -                           OFFICE PHONE : (   )   -

COMPANY NAME :                                   NEXT CONTACT :   /  /

          CODE :                        CYCLE :

COMMENTS :
```

Figure 2—15 fields are available for each record.

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		80 ns	13.60
4464	(64K x 4)	150 ns	12.50
	(64K x 4)	120 ns	13.50
	(64K x 4)	80 ns	14.50
4164	(64K x 1)	150 ns	2.80
	(64K x 1)	120 ns	3.10
	(64K x 1)	100 ns	3.70
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NVelope: A Welcome Addition To Word Processing

Reviewed by Lon Andrews

Paul Mace Software's NVelope can save you a lot of effort if you produce correspondence on your computer. This program will pop up in your word processor and capture the address on a letter. From that point you can either print the envelope or save the address to use later.

NVelope will do more than just print the envelope. It will look up the zip code from a disk file, print sideways, create a mailing list and print labels from the list.

Frequently I get (and send) letters that are perfectly typed thanks to a good word processor but are in a hand addressed envelope. It is just too much trouble to go through the process of addressing an envelope in the printer. NVelope takes the pain out of this process. It captures the address from the letter and either prints it now or saves it to use when you are ready. My printer automatically backs the paper out and lets me insert a single sheet, or envelope, and reloads the paper when I am finished with the envelope. With this capability I print the envelope before the letter is printed and then go on with the letter.

NVelope maintains my return address so I don't need to retype it. Formatting the envelope is a matter of a few keystrokes and it is finished. Figure 1 shows the sizes of envelope formats that are available from the menu. With this many sizes available to choose from you should be able to find your size. Using the arrow keys to highlight the desired size and pressing ENTER selects the size The screen display is changed to reflect your choices and the size is displayed above the envelope form.

continued on page 366

```
                              Nvelope
F1-Help  F2-Grab  F3-List  F4-Size  F5-Zip  F6-Options  F10-Print  Esc-Quit

                              Envelopes
 Air    Baron.  Catal.  Clasp  Coin  Commer.  Scarf  Secur.
 6.7      5       55      14    5½    6.75     1      6.7
 10      5½       63      25     6    7.75     4½     10
          6       68      35     7    9
                  75      55          10
                          63          11
                          68          12
                          75          14
                          87
                          90

                  Use  F7-Common Envelopes  F8-Labels
```

Figure 1. Envelope Size Selection Screen

Quick & Easy continued from page 363

ample, to print 3-Across Labels on 2¾" wide labels, you must specify single-sheet copier labels (even if you're using pin-feed stock). If you specify continuous sheets, your printer will produce an output for 3½" wide labels. A test print-out lets you quickly see what's happening.

Other print options allow you to print on envelopes (both #6 and #10), rotary index cards, and postcards. You can also print out a nicely-formatted telephone list and master list.

A Utilities Menu lets you convert your files to ASCII or comma-delimited form for use in mail merging with most word processors. You cannot, however, conveniently import data from any other programs, since the Q&E random access fields are rigidly specified.

Summary

I liked Q&E. It was easy to use, and quick for most functions. I didn't have to spend hours reading a manual, or take more than a few minutes to install the program. Q&E is friendly, powerful and inexpensive.

A big plus, not even mentioned in their promotional literature, is that Q&E makes a simple prospect/customer tracking program, since it contains code, next contact and comments fields.

Q&E is limited, however, on a floppy drive system. If you expect to have a mailing list/client file exceeding 400 records, either get a hard drive or another program.

I would like to see a few improvements mentioned earlier. These have been communicated to the program author. While I love the short documentation, I think a couple of Help screens would go a long way toward shedding light on a few things many users might not be familiar with, like the use of Plus 4, Code, and Cycle.

It is my understanding that the next revision (which will probably be available by the time you read this) will have a number of new features, as well as addressing my suggested changes.

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NVelope
continued from page 364

From within your word processor ALT + pops up NVelope (Figure 2). The envelope in the figure shown already has a return address since the program retained it from the last time I addressed an envelope. Selecting F2-Grab drops you back to the word processor where an adjustable block is formed around the address at the top of your letter. Use the arrow keys to locate the start of the block and mark it by pressing ENTER. Finish out the block to define the address and press ENTER to GRAB the address.

The address is transferred to the envelope form in NVelope where it can be edited or erased if needed. The address can also be saved to the master address list for future use. Once the address appears as you want it you can print the envelope.

Zip codes are on file in NVelope. If you put the city and state (two letter abbreviation) in the address NVelope will try to supply the zip. Since a full listing of zip codes requires 7 megs, NVelope contains a shortened listing. If a city has more than one zip you will be given a range of zips to choose from. If the zip is not supplied F5 will put you in the zip code listings (Figure 3). Typing the state abbreviation produces a blank line for the city name. As you type the city name the program narrows down the choices until the city's name is displayed and the zip is located.

Under the Options selection there is a three item menu that will allow you to enter, edit and save the return address, Change the hotkey for NVelope or unload NVelope from memory. I had to change the hotkey because the default left a character on the screen. I tried various selections on the list until I found one that worked without leaving a character on the screen.

One problem that I have with the program deals with the end of line character used at the end of the address lines. This block on screen is caused by using the ENTER or RETURN key. If this character is within the defined address block it is printed as a graphics character on the envelope. The cure was to space out several spaces after each line of the address before hitting ENTER. This keeps the character outside the address block.

How you print your envelopes will depend on the type of printer you are using. As I said earlier mine will park

continued on page 370

```
                              Nvelope
F1-Help  F2-Grab  F3-List  F4-Size  F5-Zip  F6-Options  F10-Print  Esc-Quit
                          9 (3 7/8 x 8 7/8)
Lon Andrews
5270 Sandra Drive
Titusville, Fl 32780
```

Figure 2. First Screen. Envelope with return address, ready for addressing.

```
                              Nvelope
F1-Help  F2-Grab  F3-List  F4-Size  F5-Zip  F6-Options  F10-Print  Esc-Quit
                          Enter the City
                          R

RENO                          Nevada                    89500
RENO
RENO
RENO
RENO
RENO
RENO
RENO
RENO
RENO
RENO
RENO
RENO
RENO

USE:  F7-Zipcode  F8-State + Zipcode  F9-City + State + Zipcode
```

Figure 3. Zip Code Locator Screen. RENO popped up as soon as R was typed.

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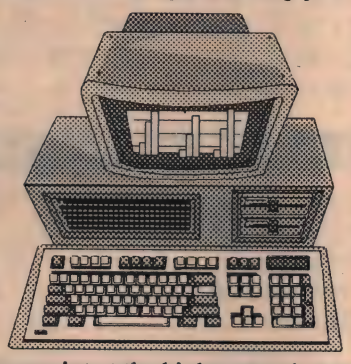

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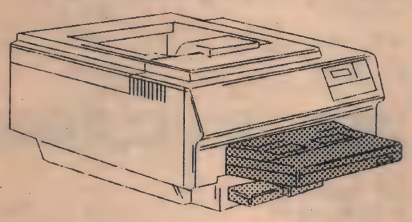

DrawArt graphics are saved in Digital Research standard.GEM format and can be loaded into any application that loads .GEM files such as Ventura Publisher, GEM Draw Plus, GEM Desktop Publisher and Publish-It. Either 3.5" or 5.25" disk formats are available. Only $69.95!

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Confessions Of A Utility Freak

by Hal Nieburg

Whose fault is it that we can't get on until the middle of the night. The teenagers tie up the lines until 2 a.m. The traffic gets heavier every day. I'm sorry that even at 2400 baud, it takes 25 minutes to receive a 296K ARC file. No, I don't think anyone is trying to call us at this hour.

Wives and lovers, don't take on so! Please, ladies, the word is "BAUD" not bawd! And it is not bad! Relax. There is nothing more innocent than a microcomputist getting his/her kicks downloading RBBS files. As a form of therapy, it is accessible, inexpensive, and rewarding, and it keeps us from kicking the dog! It is a beautiful and childlike diversion, please allow us those happy midnight hours alone with our clone, emitting now-and-then a yelp of pleasure and discovery!

I know that I will never rest
Till I possess
Every file there is
On the local RBBS

Since my recent piece on floppy disk copying, a number of other outstanding copying utilities have been brought to my attention. I wish to share them with other readers. In addition, I will use this occasion to cover a few other brilliant discoveries.

FastCopy 2.0

Robert Cumming writes recommending FastCopy 2.0, a shareware copying utility (floppy to floppy only) of unparalleled speed. Cumming has the job of putting together the "disk of the month" for the East Tennessee PCUG. Thus he has to "manufacture" several hundred copies from master disks every month (sold to members for 50 cents each). This copying utility is outstanding. It comes from Jim Nech, of Wayne Washburn & Assoc. (10114 Torrington, Houston, TX 77075, 713/941-3100 or 713/943-8561. Registration fee, $20) best for his purposes.

"I find this product excellent," he states. It has features like fast format....copies disks at the rate of one disk in 40 seconds, or 90 disks per hour. The 40 second time interval is just enough time for me to remove the copy from the drive, place a label on it, place it in a sleeve, and place a fresh unformatted disk in the empty drive..."

It requires 640K of memory and will work on machines with either 1 or 2 drives. The program was written as an alternative to the DOS DISKCOPY and FORMAT commands. It has the capability to make multiple copies of the same source diskette, or make copies of different source diskettes or format diskettes and accomplish it much quicker than DOS. It was inspired by Jack McClure of the HAL-PC users group of Houston, Texas. Alan Vanchura of Arlington, Texas contributed with technical support.

Start the program by typing FASTCOPY at the prompt, with six command line arguments:

Source Drive [A or B]
Destination Drive [A or B]
Set Force Format ON/OFF
Set Format Only ON/OFF
Set Verify ON/OFF
Set Fast Drives ON/OFF

Source and Destination must be indicated even if you are only using one drive. If the source and the destination are different the program will alternate drives. If they are the same it will use the same drive and pause and ask you to change diskettes before each copy.

If the "Force Format" option is set ON, it will format all destination diskettes. The program will format very quickly by copying the first track only. It is not necessary to copy all 40 tracks. If the "Verify option" is ON, verify will be performed on all tracks. You have the option to speedup the

continued on page 371

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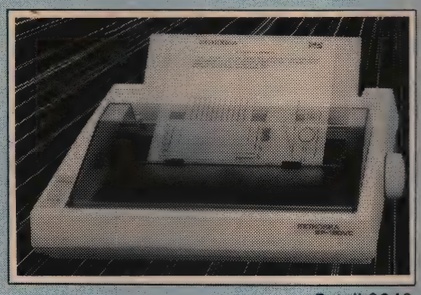

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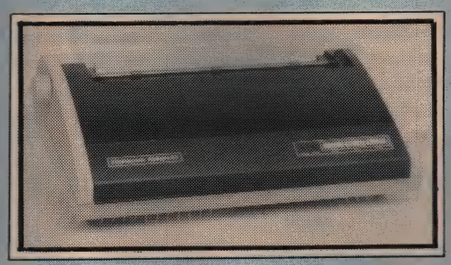

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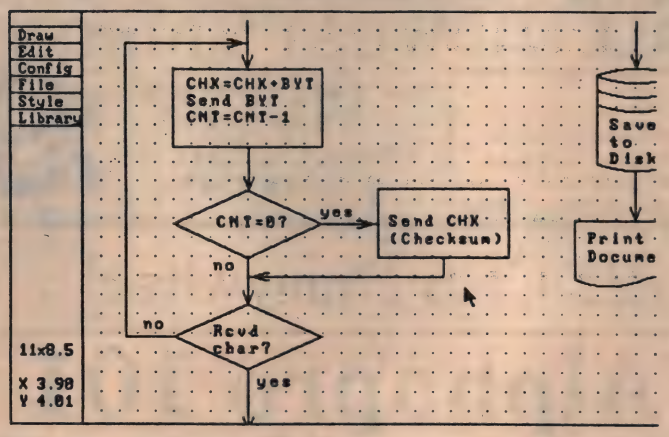

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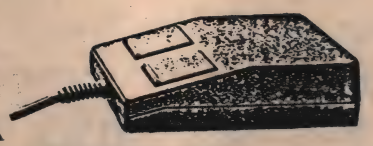

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NVelope
continued from page 366

the tractor feed paper and accept a single sheet or envelope with little or no fuss at all. If this isn't the case for your printer you might save the addresses to print them all at one time later. Alignment of the envelope is also a matter that will vary with printers. NVelope will print sideways if desired. This makes it easier to print with some of the laser printers or small dot matrix printers.

NVelope lets you select three parallel printer ports and two serial ports from the menu (Figure 4). This makes using more than one printer easy if you elect to use one for envelopes only. Printer types are also selectable from this menu.

The address list can be used for bulk mailing by selecting the option from the print menu. Addresses can be tagged for printing on the list. If none are tagged all will be printed. You are prompted to insert an envelope and press ENTER for each address. NVelope's address capability is limited only by the size of your disk but I wouldn't use it for a large mail list since it does not have a sort and select option. The tagging requires scrolling through the list and individually marking each address. If there is no need for selective mailing it will do the job adequately.

NVelope is also a label printer. From the envelope size menu F8 brings up a label menu (Figure 5) with a full selection of options for label printing. This option is worth a lot due to its flexibility. There are 18 variations of sizes and number of labels per line with no formatting necessary other than selecting the option. Once this option is selected and the desired addresses are marked, printing is selected from the menu.

This program performs very smoothly. I could not make it lock up and that is saying something with my system. It did not conflict with any of my resident programs. Outside of the unwanted graphics character on the address line and the need to change the hot key there were no problems. I would like to be able to move addresses back to the word processor from NVelope's address list instead of just from the word processor to NVelope.

NVElope, $49.95, Paul Mace Software, 400 Williamson Way, Ashland, OR 97520; (503) 488-0224. ●

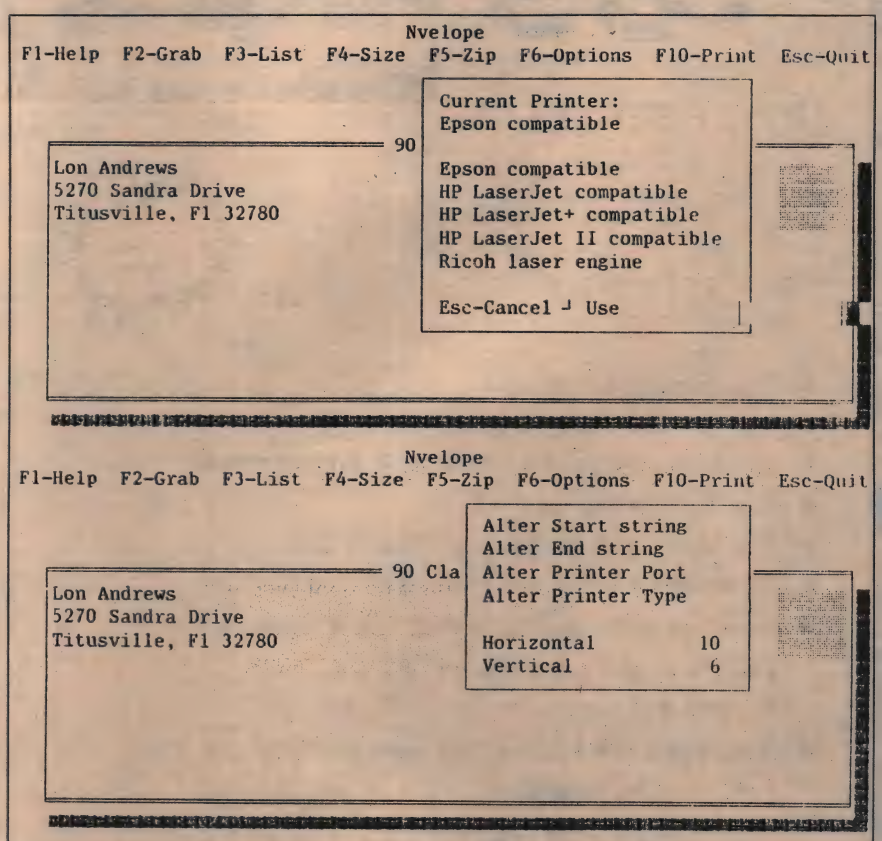

Figure 4. Printer Selection and Printer Control Menus

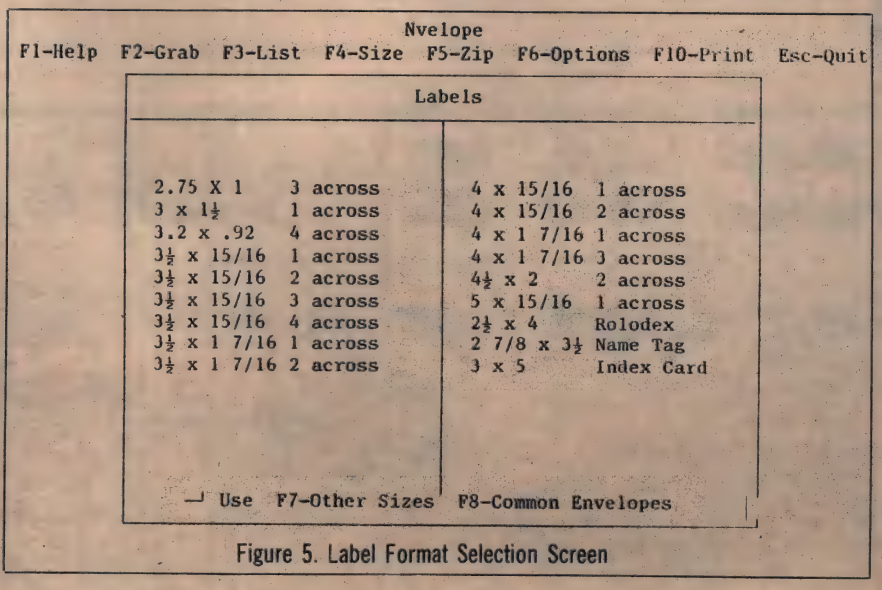
Nvelope
F1-Help F2-Grab F3-List F4-Size F5-Zip F6-Options F10-Print Esc-Quit
Labels
2.75 X 1 3 across
3 x 1½ 1 across
3.2 x .92 4 across
3½ x 15/16 1 across
3½ x 15/16 2 across
3½ x 15/16 3 across
3½ x 15/16 4 across
3½ x 1 7/16 1 across
3½ x 1 7/16 2 across
4 x 15/16 1 across
4 x 15/16 2 across
4 x 1 7/16 1 across
4 x 1 7/16 3 across
4½ x 2 2 across
5 x 15/16 1 across
2½ x 4 Rolodex
2 7/8 x 3½ Name Tag
3 x 5 Index Card
↵ Use F7-Other Sizes F8-Common Envelopes

Figure 5. Label Format Selection Screen

Confessions continued from page 367

disk drives (may cause problems on some compatibles).

To copy from A: to B: with FORCE FORMAT off, FORMAT ONLY off, VERIFY on and FAST DRIVES on, you type at the DOS prompt:

FASTCOPY A B OFF OFF ON ON

The control screen is shown in Figure 1.

The utility does not copy to an image file to a hard drive. This is its only drawback. But in all other respects, it is a tossup between FASTCOPY and SNATCHIT in speed and convenience. For certain purposes, both can be useful. My recommendation is to write a short BATCH file, so you don't have to remember all these parameters. Let's call it FAST.BAT. Now all you have to do to start the copy process is enter the command "FAST," and let it go. The BAT FILE looks like this:

```
echo off
fastcopy a: b: on off on on
```

This is a very worthy addition to the armory for those of us who have to make multiple copies of whole floppy disks! It can be found on many RBBSs around the country as FASTCPY2.ARC (17K).

Dual Disk Speedy Copier (V2.0)

Here is another product for much the same function, by Jack Fong and Arthur Zachai, Capital PC Users Group, Washington, D.C. DSSC.EXE is freeware designed "for users and software libraries to make up multiple copies of any diskette and copy them real fast to A and B or C and D drives."

This one requires at least 2 drives and at least 512K RAM. Tested on my XT-turbo clone (6.38mhz), at 80 seconds, the utility is not in the same class as FASTCOPY, but deserves a mention.

Like FASTCOPY, it has the advantage of loading memory only once, then dumping alternately to the A and B drives, shortening subsequent copying time to about 50 seconds per disk, versus 1 and ½ minutes with DISKCOPY.COM.

You will be prompted for the two disk drives (enter in upper case). The program will prompt you to put the disk to be copied into the A drive. It will then copy everything from the A drive up into memory and then prompt you to place blank disks in the A and B drives and "press any key".

You will be kept busy changing disks. "Just keep up with it and when an error occurs (like a bad disk), just replace it and strike a key to resume the copying process."

This program is yet another example of users helping users. Captial PCUG has been one of the preeminent leaders in distributing public domain software. It's motto: "Enjoy and share..." If you cannot reach that far on your telephone bill, write or call Rich Schinnell, Capital PC Public Domain Software Exchange (Voice 301/949-9292, PO Box 6128, Silver Spring, MD 20906).

More Copying Utilities

Also on many RBBSs, one may find two other related programs. The first of these in FASTDISK.COM (public domain, by Sanford Zelkovitz), which speeds up the data transfer rate of all installed floppy drives. The claimed advantage is about 35%. It will also quiet some drives considerably by not returning the heads to track 00 after each access. Head settling time is reduced from 5ms to 2ms.

This should enable DISKCOPY or any similar copying program to cut that amount of time from the operation. It can be found on many bulletin boards as FASTDISK.ARC (5K).

The second of these in FASTDUP.COM Version 1.01 (9K), an excellent general purpose utility for whole disk copying. This is user-supported software but, on RBBSs checked, have not been able to pin down its paternity. The only information I have is "LogiCom, Inc. # FST-12554." It does everything done by all of the above, except hasten disk speeds.

Like SNATCHIT, it does permit writing an image to the hard drive, and then formatting and writing to floppies on a single pass. Times are comparable to SNATCHIT. The control menu includes these options: Chance Source Drive, Generate Disk Image File, Change Destination Drive, Verify Disk Image File, Change Disk Type, and Identify Source Disk. So much on copying utilities.

SIMCGA

Here is another little patch that enables you to emulate a CGA on a TTL monochrome monitor. As pointed out in a recent discussion of HGCIBM.COM, virtually all monochrome IBM compatibles are equipped with a "graphics" video card. Whether manufactured in Taiwan or Korea, the card usually comes with 32 or 64K DRAM and emulates the Hercules graphics standard.

But most users do not exploit its capabilities and persist in the belief that they cannot run graphics on monochrome TTL monitors. They are misinformed! And, one can with either of these two programs run virtually all CGA-compatible software, including

continued on page 372

Figure 1—Control Screen For FASTCOPY 2.0

```
SOURCE    DEST    FORCE FORMAT    FORMAT ONLY    VERIFY    SPEED DRIVES
======    ====    ============    ===========    ======    ============
 A::       B::        ON              OFF          ON          ON

LOADING CONTENTS OF DISKETTE IN DRIVE A: INTO MEMORY...

(Q)Quit   (C)Continue   (L)Load new source diskette.
```

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Confessions continued from page 371

many arcade games, on monochrome hardware! Graphics resolution, without color of course, is much superior, to both a RGB or a monochrome composite display.

A monochrome/graphics card now sells for around $45 (with parallel printer port included), while a good quality monochrome TTL monitor (such as the Samsung MD 1252G, 720x350 dots) goes for about $75. For word processing and number-crunching, it offers a resolution and clarity, whether in green or amber, superior to a CGA system. And the latter costs about three-times as much. If you need enhanced CGA performance, without color, this patch will save you at least $200, and you will be pleased by its display attributes.

HGCIBM.COM comes from Gary Batson (145 Green Hills Rd., Athens, GA 30605, (404)354-4522). Version 2.01 is offered as "user-supported" software, rather than freeware. It is not copy-restricted, but registration is $9.95. Now comes another program that does much the same thing, with slightly more options and resolution.

It is SIMCGA.COM (by Chuck Guzis, 153 North Murphy Ave., Sunnyvale, CA 94086), a memory-resident utility which allows you to "fool" most software requiring a Color Graphics Adapter into using your Hercules (or compatible) monochrome adapter in the graphics mode. Graphics images are reproduced in normal aspect ratio, using as much of the available screen area as is possible.

The trick used here is to program the HGC to display more lines of 3 lines per character time instead of 4 (The CGA displays 2). A service routine hooked into the hardware timer interrupt (Int 8) copies one line to the third displayed line to give a filled-out image. This method results in some useful color gray-scaling.

It does have a few minor drawbacks: Since the copy operation occurs in real-time concurrent with the display, some "ghosting" on moving images is inevitable. Since the image is expanded vertically by ½, small line details will be affected by the line doubling technique. "This is mostly an aesthetic annoyance," Chuck Avers, and should not interfere with most uses.

Other problems are that those utilities which "read" the CGA registers at 03D4 (et sequel) are going to find no registers to read. This does not seem to affect many programs. The 40x25 text mode is not supported—the hardware just isn't there. This mode is mapped into 80x25 and again, doesn't seem to bother many utilities. Finally, when in text mode (modes 0, 1, 2 and 3), the normal monochrome character attributes are not available—this is a problem with the way the HGC handles the attribute memory map.

Quite a few programs have been tested on the TTL graphics emulator and appear to work well, including Flight Simulator, PC-CAD, BASICA and many games. Be forewarned, not all games will run.

The package SIMCGA.ARC (3K) can be found on many RBBSs. It contains three programs: SIMCGA is the memory-resident part and must be run before the CGA simulation feature is available. SETMONO will restore the monochrome-only mode; SETCGA will reset CGA compatiblity after a SETMONO. If this feature is used routinely, you might want to put both SIMCGA and SETMONO in your AUTOEXEC.BAT file and then run a SETCGA when you need the CGA feature.

Powerkit

As they say on Monty Python, "Now for somehting entirely different!" This is a shareware Cruise Control, and then some...and it will astound you!

You will like the way Powerkit handles your keyboard. A key, when pressed, starts to repeat after a waiting period whose length you set, accelerates smoothly to a top speed you set, and when released, "stops on a dime." Keystrokes also may be set to repeat very slowly, or to repeat not at all.

Powerkit's AutoPilot is a "scripting" system, recording a series of keystrokes and then "playing them back." It lets you teach your machine how to do a repetitive task, while you sit back and relax. Nice idea, what? And it can work "inside" other application software which is operating in foreground.

For example, a single PgDn keystroke can be set to repeat at a comfortable pace, to let you read a document in your word processor without touching the keyboard. It is possible to snoop through the BIOS ROM using DEBUG's Unassemble command, set the repeat to every five or ten seconds

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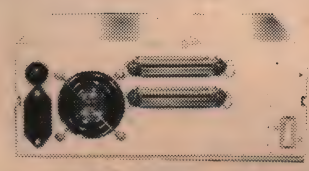

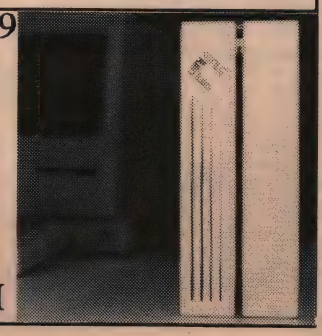

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LetterMaster—Client Management At Its Best

Reviewed by Ron Albright

There are probably many ways to review a software package as there are reviewers. The process of evaluating a new program can be effectively done in many ways. For business software, I use the "sans manual" approach. I read the manual section on how to install the software and then put it away. I then run the software and get as far as I can and put it through as many paces as possible. With business software where enhanced productivity is the end-result and time is a premium, I don't think there are any excuses to build an application that requires you to sweat blood over a 500-page manual just to get it running. I rate programs along those lines.

With this evaluation scheme in mind, I cannot help but give "LetterMaster" awfully high marks. Once you run through the installation process (directed by clear, simple on-screen instructions), you can get up and running in a hurry. Drop-down menu windows, context-sensitive help screens at every step, and function names that make sense contribute to this packages rapid learning curve. You will find yourself referring back to the manual (which is clear and concise with several sample screens) only for the most complicated tasks.

Specialization Plus

LetterMaster is a dedicated database package with one purpose and that is to make contacts and letter writing as easy as can be. LetterMaster features predefined database fields which cover everything you might need for a client's record, in addition it still offers flexibility enough to define 4 "user-defined" fields for any other unique data a record might need. The user-defined fields can be up to 50 characters in length, but one must be a date field, (an interesting stipulation). Once you have made the changes needed for the database fields, you can either enter fresh data or import it from any database capable of generating a dBase III compatible ".dbf" file.

Importing is nothing new to well-designed databases. However, the lament of those who use most predefined databases is that shoehorning existing data, exported from another database, can be problematic. To import data, one has to make sure that the fields match up. Else, the "city" field from your old database may end up in the new database's "address" field, etc. LetterMaster has the most complete importing facility I have ever used. Before it loads in the ".dbf" data, it shows you all the fields that make up the LetterMaster record and allows you to assign the data fields from the old database to any field you desire. You can use the old data in more than one LetterMaster field if you so desire or omit a field's data all together. Once you have designated where the data goes, LetterMaster imports it to the appropriate fields at the rate of about 1 record per second. Exporting from LetterMaster is nothing to sneer at either. It will export records to comply with the mail merge designations for many of the most popular word processors, including WordStar, Word Perfect, Microsoft Word, and Multi-Mate.

Letters And Reports

Once the data is available, LetterMaster really gets down to work. It can work with two kinds of formats, letters or reports. Letters are standard documents that do not contain a great deal of personalization. Using the built-in editor, you can generate the letters or you can use any ASCII file. With just four keystrokes, you can move from a client's record to a custom salutated form letter. There are some limitations. The heading for the letter cannot be changed from the conventions (standard business letter format) used by LetterMaster. Further, the editor is limited to documents less than 8000 characters in length and, while you can vary the margins, the editor cannot work with documents wider than 78 characters. You can print to the screen or a disk

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LetterMaster
continued from page 373

file as well as to printer. Incidently, LetterMaster handles Epson, Diablo, IBM, Hewlett-Packard Laserjet printers and a few other standards and allows you to customize the printer routines for other machines as well. In the editor you can also imbed "Lotus-like" printer setup strings as well.

With the second document format, reports, you are given complete control of what goes where in your print out. For truly individualized mailings, you will probably use a report format rather than the letter. It really doesn't make a difference how you put either together. Both can be done from the editor. But, you name the letters with a ".LTR" file name, and the reports can be called anything else. The printing functions are handled differently for ".LTR" files.

LetterMaster comes with 9 predefined report formats, including Call Summary, Phone Directory, Follow Up Summary, and Rolodex Cards. For example, the Rolodex report prints standard (Avery #4168) rotary cards in the following format:

John Bybee
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Barryville, NY 12719

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One Park Avenue
New York, NY 10016

Jonathan Goodspeed
Electronic Learning
730 Broadway
New York, NY 10003

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Jerry Pournelle	Peterborough	NH 03458
Mickey Revenaugh	New York	NY 10003
Nick Sullivan	New York	NY 10003

Figure 1

You don't need to specify fields or set anything up. Everything is predesigned. Of course, you can select out which records you want printed by any fields contents, including such operators as equal, not equal, less than, greater than, or contains. You can then add additional operators on other fields to be weeded out in the same way to truly extract just those records you need a report on.

The most interesting of the "canned" report formats is the "Custom Columnar" report. When this format is selected, you are presented with a list of all the database fields. You select the fields you want printed by scrolling down the bar menu and pressing "Enter" on the fields you want. LetterMaster keeps a running total of the report's width for you as you select each field. You can then select the records you want to have printed as described. For this example, I selected the name, city, state, and zip fields and the product looked like Figure 1.

If you want to build a customized report to include custom letters, it's simple. You use the editor to type in what you want your form or letter to say, identify the fields you want to use to LetterMaster and place them where you want them to appear. Database fields are designated as "@FIELDNAME," where "FIELDNAME" is the, well, field name whose data you want to use. You can eliminate trailing spaces from the field's data by using "@FIELDNAME/T" and can eliminate blank fields by using "@FIELDNAME/D."

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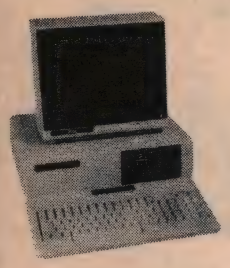
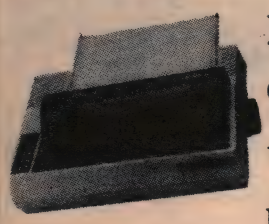

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Confessions
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and the keystrokes to U and Right Shift-Enter. When something interesting appears, press Right Shift, examine it more closely, then continue with CTRL-TAB, A.

Suppose you would like to eliminate an entire column of a table in one of your applications. You know the application has a very slick method of doing this, but you can remember only how to eliminate one line of the column at a time. Go to AutoPilot, enter the single line commands, plus a down arrow keystroke.

If that's not enough, add an extra large keystroke buffer and an ability to view what's in it, a way to route printer output to your screen, an escape hatch from programs that falter, a screen blanker, a floppy disk motor shut-off, a way to protect your machine from Ollie North or the FBI....

And then there's Hook! Hook is unique. Hook will open up many of those programs that won't let your "can't live without" pop-up utilities pop up. Hook will redefine your keyboard and store keyboard macros and side-step SideKick assignments. You can open (and close) a view-port into the keystroke buffer.

The program is John H. Brooks' PowerKit Version 1.1 (Central Data Services, 1641 Winona Court, Denver, CO 80204, (303)595-4218 or 595-4074, Registration, $9.95).

PowerKit is small, about 2200 bytes of it stay in memory. If each of PowerKit's tasks were to be done by separate "COM" programs, many thousands of bytes would be used. Almost all of PowerKit's operations may be controlled from the defining line in the CONFIG.SYS file or from the keyboard, even while you are inside another program. Many can be disabled at will.

Most PowerKit parameters may be set by including them on the line DEVICE = POWERKIT.OBJ in CONFIG.SYS. For example, the line:

```
DEVICE=POWERKIT.OBJ /b35/M15/W5/d2/f110/g14
```

Note the all-important blank space separating the command from the switches. This example can be read as follows: Load the device at bootup, change the default keystroke buffer size form 16 to 35, shut off the floppy disk motor 1.5 seconds (15 tenths) after each read/write, insert a wait before repeating a keystroke to ½ second (5 tenths), turn off the display after 2 minutes (if no keys have been pressed during that time), set the keystroke repeat speed to a maximum of 110 keystrokes per seconds, and the HOT key to BACK SPACE (14 is the decimal scan code for BACK SPACE).

The commands may be entered in any order, in lower or upper case. Not all will work with all software. For example, as the author puts it, "some programmers think the only buffer the BIOS (Basic Input Outout System) supports is the small buffer at 40h:1Eh. Their program use this buffer exclusively, thus ignoring the buffer whose dimensions the BIOS reads at 40h:80h." The keyboard redefine process enables the user to skirt key collisions between multiple memory-resident utilities.

I won't detail all the switch options here. They are very well documented (21K) in the ARC package, which is named POWERKIX.ARC (20K), and contains three files, POWERKIT.OBJ, POWERKIT.DOC, and READ.ME.

John Brooks asks rhetorically, "Why not make POWERKIT a "COM" file that could be loaded at any time?" For some putting it in CONFIG.SYS is awkard. His answer: "The extended keystroke buffer must fit in the first 65K of memory. Also, I, for one, want the extended buffer and view-port to be made available early, as I do a lot of typing-ahead while the machine is booting up."

That's my confession for today, folks. The next time my micro is burning bright in the middle of the night, I will report on more RBBS discoveries. ●

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Rapid Relay, For 5.25"/3.50" File Transfers At 115,200 BPS!

by D. Roderick Eamon

Life in the MSDOS fast lane can get complex, but answers to seemingly insurmountable problems always seem at hand.

For example, today's laptops and desktops to replace or compliment your aging MS/PCDOS computer present new problems. The problems arise in faster microprocessors, improved displays, larger memory, and higher DOS can send new owners of this advanced technology into a tailspin. Last, incompatible drive formats can drive (no pun intended) an upgrader to thoughts of vengence.

As high capacity 3.50" drives replace the more cumbersome and fragile 5.25" drives—and single-sided 3.50" drives—problems begin, cutting-edge MSDOS desktop/laptop tech or no. Here's how to transfer files between machines:

1.) Modem, or null-modem—computers tied together with a serial cable and telecommunications programs for each machine. The user "sends" files between computers.

2.) Via add-on 5.25" disk drive.

Those are two methods. Now, the headaches each one brings:

1.) Modems and null modems works for small transfers. But they are slow—at 1200, 2400, or even 9600 baud, transferring a 5.25" disk of data to the new machine—or vice versa—would strain the patience of a saint.

2.) Internal drives are relatively easy to add to a new desktop. Drawbacks: loss of rack area for a second 3.5" or hard drive, and cost—anywhere from $70-$100. More, a second drive duplicates equipment in your old machine!

Portables pose a special problem; they need an external drive. The best mail order prices for external drives in the *Computer Shopper* range from $119.00 (Walker Electronics, for a 5.25" 370K drive, powered by your computer) to $300+ (for IBM PS/2 compatible drives). Not only awkward to tote around and—compared to internal drives—expensive, their non-portability also runs counter to the philosophy that spawned laptops!

Both routes are awkward, kludgy, and borderline cost-effective. not really reasonable routes, are they?

Rapid Relay

Happily, there's a third option:

3.) Special software/hardware kits designed for file transfer through an RS-232 or parallel port, at speeds that leave null modems and internal/external complications in the dust, at a price in the range of a second drive.

Only a dedicated, systematic approach renders 5.25"/3.50"/hard drive data transfer quick and painless. One such kit, Rapid Relay, is available from

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Rapid Relay continued from page 376

Systems Management Associates (SMA).

The kit comes with a manual, two disks—one for each format—and a cable to connect two machines via their serial ports.

Making Universal Connections!

The Rapid Relay cable is truly a different beast; because of its unique design, it is universal. At both ends are one 9-pin "AT and portable computer-style" and one "Standard-style" RS-232-C 25-pin serial connector, all female; that's four ports altogether. The flawless logic behind this cable: not all computers sport the same serial port. Rapid Relay's custom cable effectively eliminates a need for extra-cost adapters for different serial ports.

I had worried about the cable: the manual states that the unused connector should just dangle. I was concerned that that may expose both computers to unnecessary static electricity; no connector caps are provided. After using Rapid Relay at different locations on IBM PC/ATs, XT clones, and Zenith portables, I ran into no problems. Still, I'd feel better with caps covering those dangling connectors.

Documentation

The Quick Start section covers all you need to begin transfer of files in a page and a half. From Quick Start through Basic Operations, screen shots of Rapid Relay's Window are visual bridges to its functions. I've seen information more concise than this, but not often.

Basic Operations carries an interesting warning: IBM's PS/2 Model 80 (and the Epson Equity) hard drive file transfers may not run at Relay's top speed, and might need a lower baud rate. Frankly, I was surprised a properly outfitted PC Junior outperforms this Personal System gem in serial transfers!

Basic Operations also teaches the moves you'll use most often: select Rapid Relay's basic parameters (baud rate, serial port), send/receive file techniques, change disk/directory, create new directories, rename and delete files. Special Features deals with Wildcards, Attributes in Directory searches, execute DOS commands in Rapid Relay, and the "RR" program (more on this later).

Thanks to the manual's simple layout, first-time setup takes minutes, even by new MSDOS users. A useful troubleshooting and technical appendix, and reasonably complete index make finding operation info simple.

Features

There are three methods of operation: menu-driven window, directory tree, and (with RR.EXE) DOS command line. Rapid Relay transfers any file, including SYS, hidden, and Read Only.

File rename/delete (and empty directory delete), and sort by name/size/-date/extension are other useful features included in the Rapid Relay kit.

The Preferences (baud, port number, screen colors, filename display, wildcards, sorting, attributes, and sound) can be customized and saved to user needs.

Operations

Rapid Relay is a Slave and master program, but both machines perform data swaps in either direction.

Rapid Relay installs on a hard drive without a hitch: I'm sure my 9 year-old daughter—beginning to learn how to use computers at school—could do it!

After installation, I never looked back. Putting the program through its paces is easy: use the cursor keys and pick menu items. A single read-through of the manual is all you need to master all but the most complex tasks.

Each disk contains two programs: RELAY.EXE and RR.EXE. RELAY-.EXE—the main, menu-base program—handles most of a user's file transfers, especially when the user changes from the 5.25" to the 3.50" format.

To transfer files: load RELAY.EXE on both machines. Pick "Receive" on one and "Send" on the other computer. Choose files by opening a directory (or directory tree), activate "Files" on the Main menu, cursor the up/down keys to highlight (reverse video), then toggle the selections in the window with the Space bar. Hit the ENTER to initiate transfer. Simple.

Key F9 selects all files, F10 de-selects them. To copy all but one or two files, simply select-all, then toggle off unwanted files in the Display Area.

115,200 BPI? Really?

Well, yes—and no.

Although advertised as faster than LapLink 2.6 and Brooklyn Bridge 1.41, the times are close; both have since been updated to run at Relay's speed. A plus: Rapid Relay needs little computer memory—128K.

From hard-disk to hard-disk, it's accurate for single file transfers, if you discount the time taken to confirm a successful transfer. A 363K byte transfer (23 files, 15.8K averge size) between hard disks takes 57 seconds. That's 2,904,000 bits, or 50,947bps. Obviously, error-checking gobbles time. Still, it's five times 9,600bps!

RR: Relay's Key To Extended Life

RELAY.EXE is speedy, easy to use, and cost-effective. But after you've completed the initial files and programs, then what? It's fine for the huge task of moving great amounts of data, but a tad awkward for daily or weekly updates.

This is where RR.EXE comes in. RR.EXE's aim is simple: to prolong the useful life of your investment. RR allows file transfers with DOS commands, minus Relay.EXE's menus. Generating batch files at regular intervals (daily, weekly, or monthly), a common practice in small businesses, is RR's strong point.

RR.EXE reads commands from ASCII text files to give user-control over what is sent, whether or not to update/backup specific files, etc. Batch files can transfer unattended, and transfers-in-progress can be halted with the Esc key.

Finally, RR.EXE is half as large as Relay.EXE. The small size frees space

continued on page 378

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LaserTORQ

Reviewed by Charlie Randall

One of the things that I have noticed about computer users is that we are an impatient bunch. When I was in college, the turnaround on getting my programs compiled was usually an hour or more, sometimes a day. At that time, it didn't bother me. But now, if a compile takes more than about 10 or 15 seconds, I check to see if the computer is still plugged in. We not only expect speed—we demand it.

The latest thing to bring this to my attention is laser printers. They produce the best, most professional-looking printouts, albeit very slowly. But now, things are changing. LaserTools has brought speed to the printer world in the form of LaserTORQ. Not only is LaserTORQ fast, but in the course of a week or two, it could easily save you an hour or more of unproductive time.

LaserTORQ is an exceptionally good print spooler, or as its creators call it, a print accelerator. And although it is primarily designed for laser printers, it can be used with any printer.

LaserTORQ replaces the print facilities provided by DOS, greatly accelerating the process of sending material to the printer and allowing you to get back to work. Anyone who has worked with laser printers knows how much time it takes to send the printout data to the printer. During most of this time, the system is tied up. LaserTORQ changes all this. It is able to intercept data headed for the printer, usually in a matter of seconds. Since LaserTORQ is able to accept data much faster than the DOS print facilities and then handle the actual printing in the background, you can quickly return to your application.

How does LaserTORQ work? Basically, it substitutes its own routines for those of DOS. It replaces the DOS printer port entry with a pointer to its buffer. Then it intercepts data sent to the printer port, buffers it, and sends it to the actual printer port. Naturally, buffering the data takes much less time than acutally sending the data to the printer, and this is what gives LaserTORQ its speed.

The major difference between LaserTORQ and other print spoolers is that it completely replaces the DOS printing routines. Spoolers typically just use these slow DOS routines. Their main benefit comes from the buffering of data for the printer. They still suffer from the slow background operation associated with the PRINT command. Either the printing is slow or the DOS command level response is sluggish, or both.

With LaserTORQ, there is little penalty for the increase in printing efficiency. The total time it takes from activating the printing process until the printed copy pops out does not increase. In some cases, it decreases!

One of the many nice things included in this package is a benchmarking program. Laser Tools Corporation wants you to verify the full power of LaserTORQ. To do so, they provide typical printout samples from Harvard Graphics, Pagemaker, and Microsoft Word. A demo program is also included to both send these samples to the laser printer and to time how long it takes to send the printout.

Ever skeptical, I also performed several of my own tests, using files of my own creation and a stopwatch. All tests were run both with and without LaserTORQ installed.

I tried several different setups to get a good feel for the true power of LaserTORQ. The first setup consisted of an AT-compatible PC and a NEC LC-890 laser printer. The nice thing about the NEC is that it has both LaserJet and PostScript emulations. I was thus able to check LaserTORQ's performance with both of the major categories of laser printers.

The numbers in all cases were truly impressive. I started with the PostScript emulation. The demos ran as follows: Pagemaker: 26 seconds without LaserTORQ installed, 2 seconds with LaserTORQ; Harvard Graphics: 128 seconds without, 16 seconds with; Microsoft Word: 65 seconds without, 2 seconds with.

I took a 3-page document that I had recently created with Word and printed it. Without LaserTORQ, it took 45 seconds; with LaserTORQ, it took only 7 seconds. And after those 7 seconds, I was back in Word poking around, looking for more old documents to try. The neat thing about this last case was that the total time to print was slightly shorter with LaserTORQ installed than without it installed. Next, I had a friend try it with a one-page Harvard Graphics printout. Without LaserTORQ installed, it took 67 seconds;

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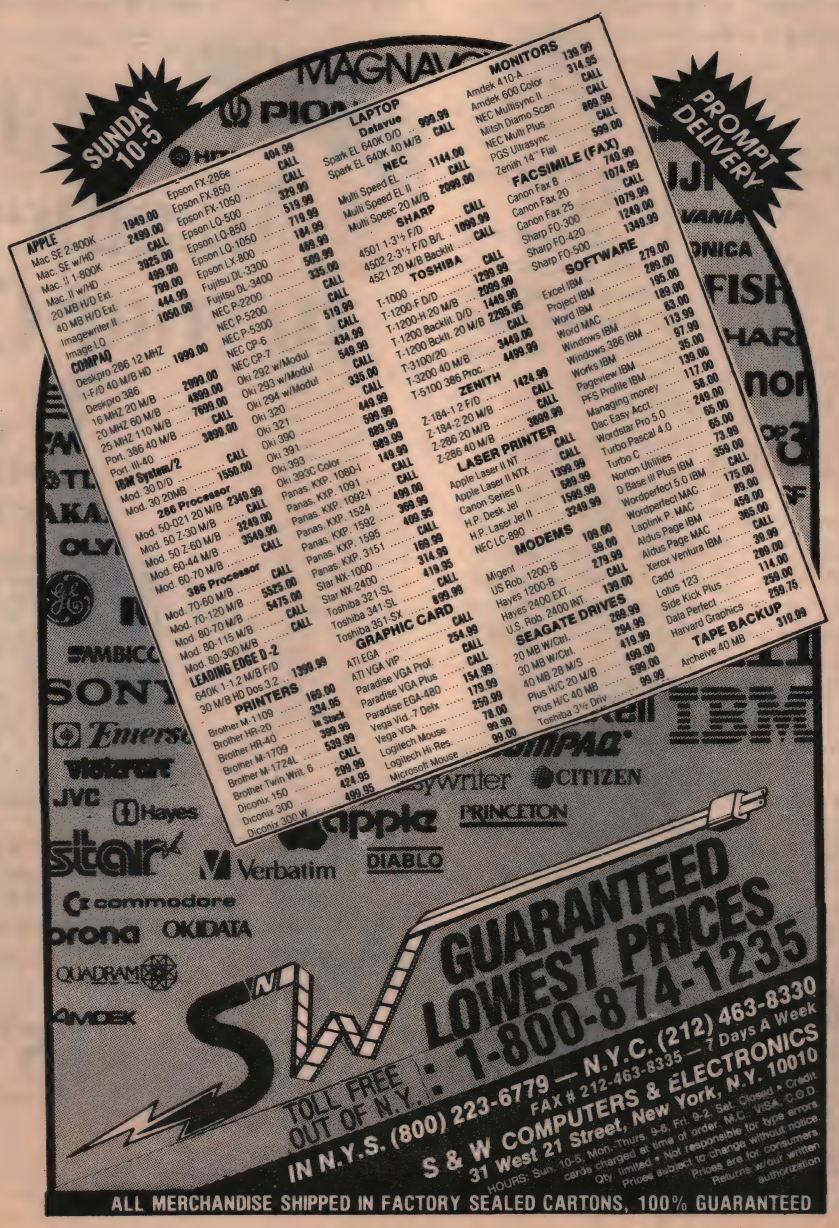
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Rapid Relay
continued from page 377

on floppy-only portables, makes it easy to live with RR.

Being new to MSDOS, I expected to be overwhelmed by a program this specialized. I expected nothing this simple!

Funneling files between any MS/PCDOS computer is a breeze, no matter the hardware. Rapid Relay is, like LapLink, easy to use. With RR.EXE—it has more moves. It's a power-user's file/program transfer kit that I heartily recommend. Never has rapid transit run so smooth!

Rapid Relay runs on IBM PC, XT, AT, PS/2, and true compatibles w/128K or more RAM; IBM compatible serial port (COM1 or COM2). DOS version required: 2.0 or later; video supported: mono, VGA, EGA cards. Copy Protection: none. Minimum RAM required, 128K. Suggested retail price: $99.95. ●

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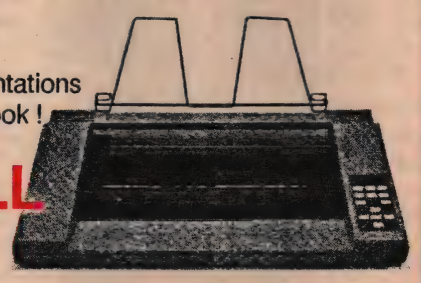

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LetterMaster
continued from page 374

For example, a typical address from your database would appear as:

@FNAME/T @LNAME/T
@TITLE/D
@COMPANY/D
@ADDRESS1/D
@ADDRESS2/D
@CITY/T, @STATE/T @ZIP

LetterMaster also conveniently allows for the following fields not in your database's records:
@DATE = The current date in MM/DD/YY format
@TIME = The current system time in HH:MM:SS format
@TODAY = The current date spelled out (August 11, 1988)
@USER = The user's (your) name
@RECORD = The record number
With these options available, you are absolutely unlimited as to the reports you can generate.

A utilities section allows you to rebuild the database index (useful after you have deleted one or more records), recover a database (damaged or accidentally deleted or some other act of God), and scan for duplicate records within your database. You can have LetterMaster display the vital stats for your computer (memory, etc).

OK, so what?

Now, I am sure there are a number among you who are inveterate dBase or PCFIle or other database users. You are probably saying to yourself that you can do these same things with what you have already. I have to admit, with a little work, I was doing most of these functions myself with my flat-file database. Certainly, not as easily, but I was doing basic database manipulations, form letters, etc. No doubt, I have to convince you that there is more to LetterMaster to get you to change over. Well, here is the convincing:

1. Automatic dialing—LetterMaster contains a versatile modem routine to dial the phone numbers of clients within your database. It works with a Hayes-compatible modem. You can configure the dialing sequences for local, long-distance, and international calls.

2. A "tickler" routine, that allows you to date your client's records for their next follow-up letter or call. Then, when you boot LetterMaster on that day, you can find all the records flagged for contact on that date through the "Today's Contacts" menu choice. You can also quickly check for the follow-ups for any date you specify.

3. Compatible with most memory-resident (TSR) utilities (including SideKick).

4. You can use a "macro" to repeat the "keywords" field in subsequent records during adding records.

5. Exit to DOS to edit, save, delete DOS files.

6. Set up company name for automatic incorporation into reports.

There are others. But you get the idea. LetterMaster is, quite simply, completely full-featured and offers a great deal of custom features over the traditional database. It would be extremely useful in managing any sort of business—from mail order to local real estate—in managing client contacts and mailings. LetterMaster is strongly recommended. Though not reviewed, the network version of the software offers strong features for handling the requirements of a large number of users sharing a common database. Incidently, a new release is planned by the time your read this review which will include mouse support, enhanced laser printer drivers, and improved label-handling allowing for 1, 2, 3, or 4 across label generation. The version reviewed only allowed for 1-up labels.

Summary

LetterMaster is a dedicated client database that facilitates a wide variety of custom mailing and people management. It can generate forms and mail-merge documents quickly and can dial clients automatically with a modem. It sports the best import function I have seen for existing dBase files.

Product information: LetterMaster is $189.00 (single-user) and $495.00 for a network version (which is compatible with most major networks, including Novell, 3Com, MicroSoft and IBM) plus $5.00 shipping and handling. The package includes both 5¼" and 3½" disks. It can be ordered directly through Research Development Systems (P.O. Box 110216, Arlington, TX 76007; 1-800-338-9181). System requirements: IBM PC or compatible, with two-disk drives, 512K, and DOS 2.1 (networked version requires 640K, DOS 3.1 or higher). System used for testing: Zenith AT-compatible, 512K, dual-floppies, 20 meg hard drive, and EGA monitor. ●

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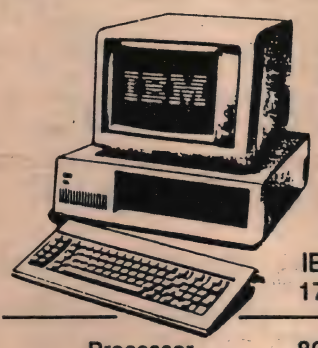

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LaserTORQ
continued from page 378

with LaserTORQ installed, only 20 seconds.

Following this, I switched the NEC laser printer to HP LaserJet emulation. Again, the results were impressive. My 3-page Word document took 21 seconds without LaserTORQ, and 8 seconds with it. I also tried printing out a text file from the DOS command line by entering COPY README LPT1:. Even though it was only 3 seconds before the DOS prompt came back without LaserTORQ installed, with LaserTORQ the prompt returned almost immediately.

It is recommended that you use COPY instead of the PRINT command since LaserTORQ has replaced the DOS printing routines upon which PRINT is based. I renamed the PRINT command on my machine to PRINT! and added a batch file (PRINT.BAT) containing the line COPY %1 LPT1:. If you use this remember that there is no form feed between files as in PRINT. Should you really need this, it is not hard to add.

But LaserTORQ isn't just for laser printers. I also tried it with my Panasonic 1091 dot matrix printer. Again, I used the 3-page Word document, and the results were even more impressive. Without LaserTORQ, it took 76 seconds; with LaserTORQ, only 6 seconds! After just 6 seconds, I was back in Word making notes for this review, while my printer was acting like it was a totally separate system. It was not affecting me, and I was not affecting it.

LaserTools also sells a version of this program for non-laser printers. This version, TORQ, sells for $79. But if there is even the remote possibility of you some day using a laser printer, get LaserTORQ. It is well worth the extra $20.

Although the documentation is small—only 55 pages—it is very complete. Everything is explained in a clear and concise manner. The documentation has a thorough table of contents and index. The documentation is logically laid out, leading the reader through background information, installing LaserTORQ, using the program and finally, possible difficulties.

To supplement this material, there are 6 appendices. One of these describes the error messages that LaserTORQ may generate. The rest of the appendices discuss printer, port, and special installation information.

Since this is a simple (though elegant) program, there is very little to learn. What little knowledge you need to operate LaserTORQ can be easily picked up from the documentation. Once the program is installed in memory, there is little for the user to do. LaserTORQ sits quietly in the background, taking care of the printing chores.

The setup process is another area where this product really shows the time and care that was taken in designing and producing it. The manual clearly outlines each step of the installation process. Example scenarios, along with the reasoning behind the options chosen, are provided for several different possible setups. The whole process is so easy, even my boss could do it!

The installation process uses pull-down menus to set LaserTORQ's options. During installation, these options are always visible in a window at the bottom of the screen. Any time during the actual process, pressing [F1] will bring up help windows.

Several features make the install program really nice. It includes a test to determine if the options chosen will work with your printer. Should this test fail, the program and the documentation offer several helpful suggestions.

Another nice touch is the memory survey. This feature determines the type and size of memory you have available for the program to use for its buffer. LaserTORQ can use extended/expanded memory (and all its variations), conventional 64K memory, a hard disk, or a floppy disk. (The manual sensibly recommends not using floppy disks.)

Since LaserTORQ handles any redirection of serial and parallel ports for printing, the MODE command is no longer needed and its removal is recommended. To assist in the removal of files using the command, LaserTools includes a utility that checks all the batch files on your disk and tells you if any of them use the MODE command. It is then a simple process to edit out any references to MODE in these batch files.

A nice option for LaserJet users is optimization. LaserTORQ contains two optimization modes for LaserJet graphics, "full" and "quick," for memory and speed optimizations, respectively. The full optimization minimizes the amount of memory that the graphics printout will use. This will allow an almost full page of graphics to fit into the 512K memory of a LaserJet.

The quick optimization minimizes the amount of data sent to the printer. This is especially timesaving when using a serial port. The default is no optimization. Normally, this is the fastest option. But with a lot of graphics, one

continued on page 386

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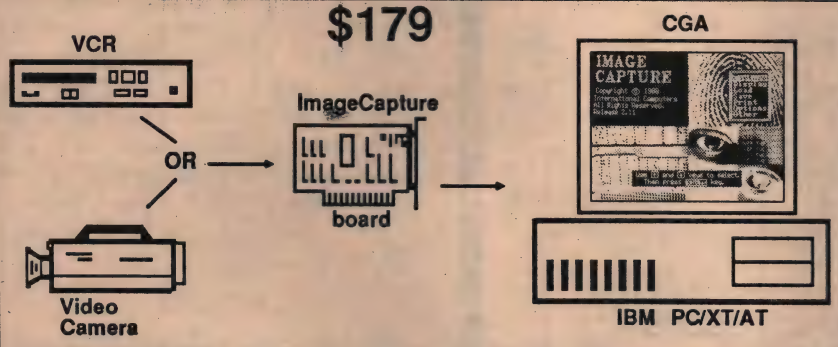

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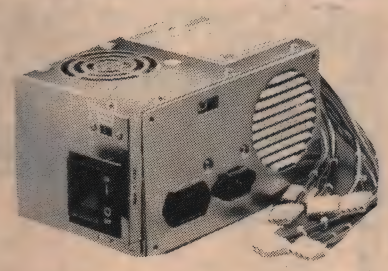

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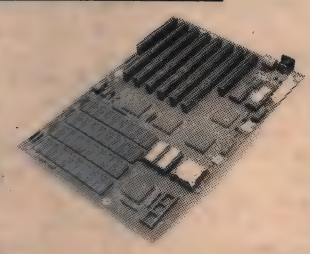

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by Hal Nieburg

Here we are once again, happily downloading free utility software from local bulletin boards! Every day it gets harder and harder to avoid a busy signal. The crush is getting out of hand. Some Sysops, those angry one-eyed giants, have imposed users' fees in an attempt to regulate the traffic. The truth is getting out!

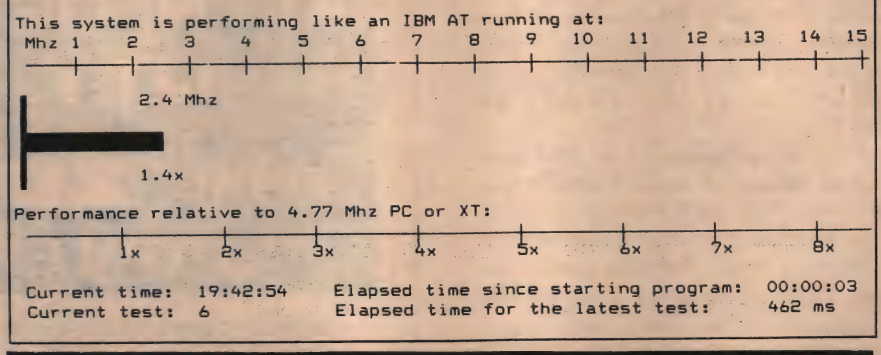
The quality of free software is improving at an astounding rate. Among individual programmers, talent, insight, and sheer inventiveness are ever more common. The amount of exciting software available for the downloading, burgeons like flowers in spring, tra-la! The commercial publishers are stealing ideas and code from that irrepressible source.

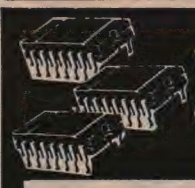
Today we look at seven examples from the treasure trove, most of them modest, but nonetheless useful. They are little conveniences, adding only a small margin of user comfort and pleasure to our lives... Of how many things can this be said? They are tiny addenda, marginal perhaps, but which accent and give style to our micro tools.

Speed99

This is another neat visual display of computer speed. The program displays the speed in two ways: Relative to an IBM PC or XT running at the standard 4.77 Mhz (so 2x means twice as fast as an IBM PC or XT) and as the equivalent clock rate on an IBM AT (so 6 Mhz means the same speed as a 6 Mhz IBM AT).

Figure 1—The Landmark CPU Speed Test: Speed Version 0.99


This system is performing like an IBM AT running at:
Mhz 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
2.4 Mhz
1.4x
Performance relative to 4.77 Mhz PC or XT:
1x 2x 3x 4x 5x 6x 7x 8x
Current time: 19:42:54
Current test: 6
Elapsed time since starting program: 00:00:03
Elapsed time for the latest test: 462 ms



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An AT running at 6 Mhz performs this test 3.4 times as fast as an IBM PC or XT. The results for an AT running at 6 Mhz would be 6 Mhz and 3.4x. The results for a standard IBM PC or XT would be 1.8 Mhz (since 6 Mhz divided by 3.4 is about 1.8 Mhz) and 1.0x. Figure 1 shows the screen.

Unlike the widely-quoted Norton speed test (SI.EXE) which gives an unrealistic (and erratic) reading of 5.7x for a 6 Mhz IBM AT, this utility gives a reading of 3.4x which accurately reflects the relative speed of a 6 Mhz AT vis-a-vis a 4.77 Mhz PC or XT on typical computational activities. The algorithm used for the test involves no disk I/O; the use of a math coprocessor does not (and should not) affect the results; the number of wait states does (and should) affect the results.

This program (Version 0.99) is by Landmark Software, 1142 Pomegranate Court, Sunnyvale, CA 94087, 408/733-4035), and can be found on many BBS. SPEED99.COM is 26K; the archived version is SHOWSPED.ARC, 22K.

SLOWDOWN

While we are talking clock speed, here is a tiny helpmate (512 bytes). SLOWDOWN (Version 1.1a) offers the ability to change effective clock speeds directly from the keyboard at any time. This enables users to fly the MicroSoft Flight Simulator at nominal speeds even on a 16 Mhz AT, or reduce the speed of any arcade game for children and novice. The usage (where <percent> is between 0 and 99) is:

A>SLOWDOWN <percent>

If <percent> is entered as "0," the SLOWDOWN interrupt is removed from RAM, and the CPU returns to nominal speed. This public domain utility does not contain any accompanying DOC files, so I am unable to ascribe authorship. It can be found under its own name, or packed in a file named SLOWDOWN.ARC (788 bytes).

DIREDIT

A much more ambitious undertaking, DIREDIT is another directory editing utility, but one with notable functions well beyond mere directory sorting. All the others, for example Norton Utilities allows directories to be sorted by filename, by file type ("extension"), by modification date, and by size, but DIREDIT is (as far as I know) the only one which also allows the user to specify an arbitrary order and/or to move individual directory entries around at will.

DIREDIT also displays the directory in a very compact manner, with up to 80 file-names visible on the screen at once, but allows you to see the full file description for any entry simply by moving a cursor to the name.

What's the point of all this? Well, one answer is that the order in which

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Freeware/Shareware continued from page 382

sub-directories and files are listed is the order in which DOS (when asked to find a data file or executable program) searches through the list. It follows that programs and data files will be accessed fastest if they appear at the top of the directory listing of the sub-directory in which they are found, and also that sub-directories (especially those which are specified in your PATH command) should, for fast access, also be at the top of the directory listing.

One the other hand, many people find it easier to find a file that they are searching for if the directory is sorted in some other way. The advantages (in this context) of alphabetical sorts by name and/or type are obvious, but sorting by size or date/time can also be useful.

DIREDIT can perform in both ways simultaneously, arranging directories for efficient access and then resorting them temporarily on the screen when searching for a file. Further, the ability to sort by any other arbitrary rule enables the user to personalize the directories according to any unique purpose or to taste. Furthermore, dates and times can be edited at will. No other DOS-keeping utility offers these dimensions.

DIREDIT was written principally in C, compiled by the Microsoft C compiler (Version 4.00) using its "small" memory model, and linked with code from the distributed Microsoft C object libraries using the Microsoft LINK program (Version 3.51). Additional assembly language routines were assembled by the Microsoft MASM Macro Assembler (Version 4.00). The 1986 release is usable on almost any DOS disk device, without requiring BIOS compatibility. The ANSI screen driver should be installed on those systems (including IBM PCs) which do not support ANSI screen I/O in Video BIOS.

In use, DIREDIT has a very innovative display, shown in Figure 2. On the upper 20 lines of the terminal screen are displayed up to 80 "identifier blocks," each comprising an ID number (which initially corresponds to the position of the directory entry in the directory) and a file name.

An inverse video box cursor, initially positioned over the first (top lefthand) block, indicates the current entry. This box can be moved to highlight any visible block by using the arrow keys. The "Cursor->" display line at the bottom of the screen shows the full description of the file or directory whose name is in the current block. If there are less than 81 active directory entries (the normal case!), all will be displayed all the time, otherwise only the first 80 will be visible.

When you enter "S", the program will determine, by asking you a series of questions, how you want the directory to be sorted. The first option presented is: "User-Specified Order?"—responding to this prompt by entering "Y" allows you to rearrange the file entries in an arbitrary order. You will then be prompted to enter two lists of file numbers (the numbers displayed next to the filenames on the screen).

The first list should contain the numbers of files which you would like to move to the top of the directory (in the order in which you want them to appear there)—the second should contain the numbers of files which you want to move to the bottom, also in the order in which they are to appear.

Authored by Peter R. Fletcher (220 Ballard Drive, West Hartford, CT 06119), registration fee US is $20, Canada $30, unless you are already a registered user of HDTEST, in which case it is $10. Support is available by mail, BIXmail, Compuserve EMail and, for an experimental period, telephone.

"Please also bear in mind," Peter writes, "that my willingness and ability to continue to support and enhance these programs will be directly dependent on your willingness to pay the registration fee and inversely dependent on the number of questions I get that could be answered by reading the documentation(!)."

Chop

If when chopping, you detect an appetizing aroma, it is because my heart is really in this one! I am truly attached to this modest little file-chopper, which enables the user to painlessly break any data file into parts of user-determined sizes. Written and released into the public domain by W.J. Kennamer, this utility has saved me on several occasions.

continued on page 386

Figure 2—Typical Directory Editing Display

```
 1:WHATIS.DOC    | 21:THISIS.DOC    | 41:FURTHER.COM   | 61:ARCE.COM      |
 2:ARCE.COM      | 22:COPYSAFE.COM  | 42:SCANDIR.COM   | 62:PKARC.COM     |
 3:ARCTLDIR.COM  | 23:DDIR.COM      | 43:SCROLL.COM    | 63:PKARC.DOC     |
 4:ARCTOOL.COM   | 24:DIREX.COM     | 44:SEARCH.COM    | 64:PKXARC.COM    |
 5:ARC.DOC       | 25:DISKPREP.COM  | 45:SIZE.COM      | 65:SETCGA.COM    |
 6:ARC.TXT       | 26:DISKSCAN.COM  | 46:SNAPSHOT.COM  | 66:SNATCHIT.COM  |
 7:ARC512.EXE    | 27:DOS-EDIT.COM  | 47:SPECTRUM.COM  | 67:DISKSQ.COM    |
 8:ARC.EXE       | 28:EATMEM.COM    | 48:UNDEL.COM     | 68:DISKSQ.DOC    |
 9:ARC521.COM    | 29:KEEPER.COM    | 49:UNLOCK.COM    | 69:DISKUNSQ.COM  |
10:ARCA127.COM   | 30:LOCATE.COM    | 50:BNCHMK.EXE    | 70:MATH.EXE      |
11:TXT2COM.COM   | 31:LOCK.COM      | 51:ARCE30F.COM   | 71:ANSIEDIT.EXE  |
12:ARCA127.DOC   | 32:LPTPORT.COM   | 52:ARCE3.COM     | 72:SETMONO.COM   |
13:ARC450.COM    | 33:MAPMEM.COM    | 53:CONFIG.SYS    | 73:SIMCGA.COM    |
14:ARCA286.COM   | 34:NO.COM        | 54:READ1.ME      | 74:SIMCGA.DOC    |
15:ATSIZE.COM    | 35:PCMAP.COM     | 55:RECORD        | 75:CHOP.C        |
16:DATA          | 36:PR.COM        | 56:SNATCHIT.DOC  | 76:CHOP2.EXE     |
17:BROWSE.COM    | 37:PRSWAP.COM    | 57:SW.COM        | 77:CHAP1.DOC     |
18:BACKSCRL.COM  | 38:RAMFREE.COM   | 58:SW.DOC        | 78:KEY.COM       |
19:BOTH200.COM   | 39:RELEASE.COM   | 59:ARCMASTR.BLD  | 79:NEWGRAFI.FOB  |
20:CACHE.COM     | 40:REMOVE.COM    | 60:ARCMASTR.CFG  | 80:POWERKIX.ARC  |
Cursor-> UPDATE.COM    September 8, 1987   10:57:54   64512 Bytes
Moving->
PgUp : window up | PgDn : window down | Home : Dir top | End : Dir bottom
                 | M : next menu line - Windows are locked
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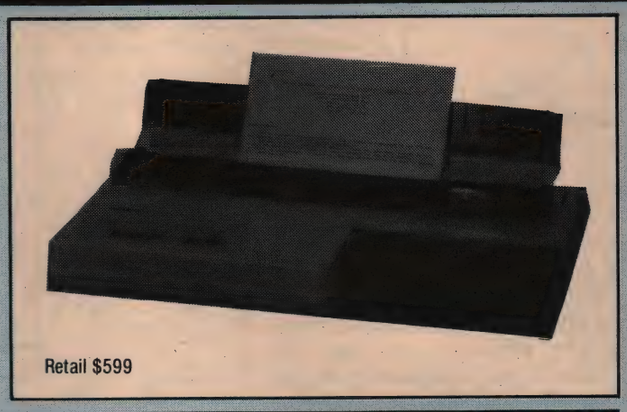
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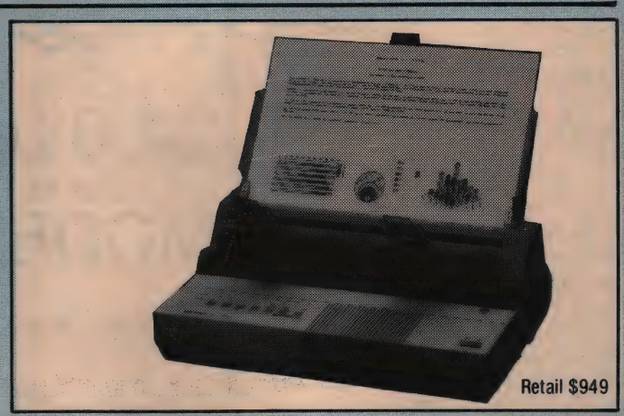
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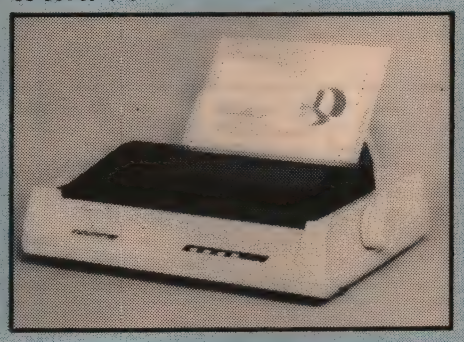

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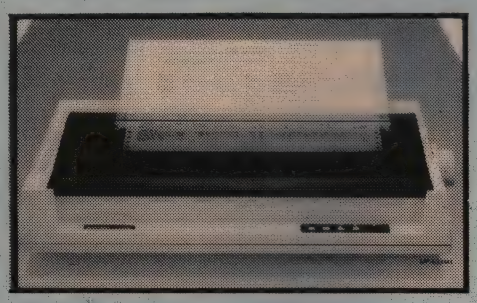

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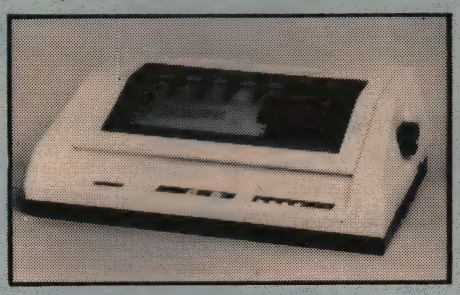

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Freeware/Shareware
continued from page 383

Have you ever confronted a long text file of several 100K which came from a mainframe line editor? You desire to work on the file on a micro, but the working buffer (or the memory available in the machine) is limited, or perhaps the length of the file can be managed, but slows the micro editor to an exasperating crawl? What to do? CHOP.COM to the rescue!

The syntax at the DOS command line is:

C>CHOP <PATH> FILESPEC.EXT <SIZE> -SWITCHES

FILESPEC.EXT is any valid MSDOS filename. Wildcards are not supported. The switches available are shown in Figure 3.

The output files will write in order as smooth as silk, named after FILESPEC, with a set of new extensions in numerical order, such as FILESPEC.1, FILESPEC.2, etc. Output files are always terminated with a carriage return and a 1AH (end-of-file symbol), also known as <Ctrl>-Z. SIZE is the desired file size for each new file. Switches may follow both the FILESPEC.EXT and SIZE parameters, and may be entered in any order. Switches may be combined.

Figure 3—Valid Switches For File Chopping Utility

-s strict	chop file at exact SIZE boundary.
-r return	chop file at first carriage return following SIZE characters (default).
-ox partition	partition file into x equal units. SIZE is ignored (and may be omitted) if you choose this option.

XRAY

Another tool for accessing sector addresses from RAM residency while running other programs in foreground. It is offered as user-supported software by John F. Ferguson II (6108 Earnshaw, Shawnee, Kanasas, 66216), who writes, "I am not actively marketing this tool, but if you find XRAY of use to you please send a $20 or less contribution. Feel free to contact me if you are interested in any of the technical aspects of XRAY."

Once the utility is loaded into memory (occupying 11K in residence), combination keys <Alt + Lft-Shift> invokes the main menu, which looks like Figure 4, page 388. These I think are self-explanatory. The commands for accessing specific hex code sectors include "Wake Up, Set Scroll, Window Size, Change Address, Current Location, and Unhook XRAY." The speed of scrolling and window sizes can be readily manipulated.

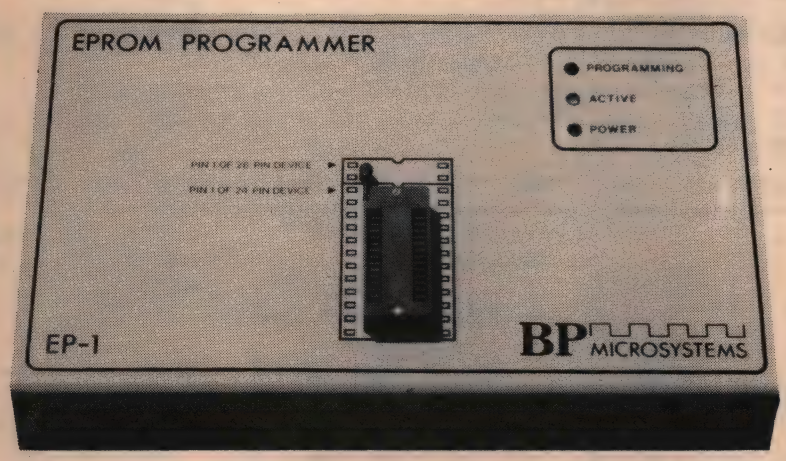
DISKSQ/DISKUNSQ

Unite a whole floppy disk into a single file with an average compression of 50 to 60%. With this on board at both ends, software and data can be exchanged with half as many floppies, saving floppies, postage, and time; and can be sent over a telephone line in half as much time.

Like the many archiving utilities on every RBBS, this one packs and unpacks data, with a slight difference: the source is a whole floppy. The progam takes floppy size bites, and outputs a single file. It is easier to use than other archive algorithms because it limits itself to whole disk concentration/de-concentration only, and therefore does not require a complicated syntax, with the use of switch

continued on page 387

EPROM PROGRAMMER



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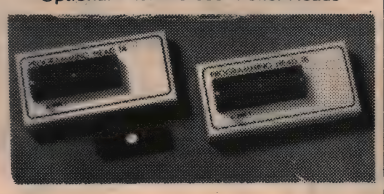

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LaserTORQ
continued from page 381

of the others may be better. This option setting can also be set from within LaserTORQ, once it is loaded into memory.

Should you need to change any of the values set during installation, simply rerun the install program, make any necessary changes, test the new values, and save them. If you have LaserTORQ loaded in memory when these changes are made, it senses that changes have been made and reminds you to unload and then reload it to activate the changes.

To start LaserTORQ, simply enter the following command at the DOS prompt: LTORQ. It does not seem to care what order it is loaded in, and appears to work well with other memory resident software. Those who have little memory to spare will be glad to know that LaserTORQ only takes up about 20K. Since LaserTORQ essentially replaces the PRINT command and the resident part of PRINT uses about 5K, the net memory loss is only 15K. This is a small price to pay for all that is gained.

LaserTORQ can be removed from memory by entering: LTORQ U. Although this removes it from memory, the memory will not be available unless it was the last memory resident program loaded. This, unfortunately, is true of any memory resident program.

To check on LaserTORQ while it is running, press the hot key. The default hot key is the [Alt][T] combination, but this can be changed to any [Alt] key combination during installation.

Pressing the hot key invokes the LaserTORQ pop-up window. This window displays some of the settings such as printer status, port assignments, buffer size, optimization status, and amount of buffer currently in use. Two commands are also available from the window. Pressing [Ctrl][S] suspends the printing process, and [Ctrl][C] clears the buffer.

This brings up the only problems I have with LaserTORQ. This last command clears the buffer, the whole buffer. It would be nice if a command existed to delete only certain printouts in the buffer. While I'm wishing, it would also be nice to be able to reorder printouts in the buffer. Of course, the more of these features added to the program, the more RAM the program will need and the slower it will run. Compromises, compromises!

It would also be nice if the selected printer type were displayed in the pop-up window for those of us with two (or more) printers and poor (human) memories.

Original IBM PCs and those early clones that copied its parallel port design will have a problem with LaserTORQ. It seems that this port design was flawed in its use of interrupts. LaserTools both describes how to make a printer cable to compensate for this, and offers to sell you such a cable. Unless you are a hardware type, the $15 is well worth it; the cost of the parts is almost that much.

LaserTools Corporation provides toll-free telephone support during normal business hours (Pacific time). A call to the support line was answered quickly and courteously. The gentleman at the other end answered my questions knowledgeably and, for the most part, quickly. For one question—I always try to throw in a zinger—he had to briefly place me on hold. This is one time I did not mind, as it was their nickle. He came back shortly with a good explanation. I was very pleased with their technical support.

LaserTools gets high marks for their support. Not only do they provide the toll-free support, but they ship the product second day UPS for no extra charge. They really do believe in speed!

Unless you really like waiting around for your printer to return control to your system, I highly recommend that you get LaserTORQ. Everyone I showed the program to was equally impressed. And at only $99, it doesn't take long for LaserTORQ to pay for itself. LaserTORQ is outstanding! No laser printer should be without it.

LaserTORQ (Version 1.04), LaserTools Corporation, 3025 Buena Vista Way, Berkeley, CA 94708; (800) 634-3743, (415) 843-2234. Requires: IBM PC or compatible, DOS 2.0 or higher. List price: $99. Not copy protected.

Freeware/Shareware
continued from page 386

and redirected input/output commands.

From Graham Systems (238 Germonds Rd., West Nyack, NY 10994): "If you use this product in a commercial way you must compensate me for my time. $5.00 is too little to ask for the hours put into developing this product."

DISKSQ.COM and DISKUNSQ-.COM are programs which allow a DOS 8 or 9 track disk either single or double spaced to be compressed into a DOS file. The algorithm acts on strings of recurrent characters. It squeezes from 4 to 256 repeating characters into 3 characters. This represents a fairly efficient compression ratio.

To make sure that unused portions of a disk are composed of repeating characters, and therefore compressible, a small program is included CLEANDSK.COM, which will clean up the unused sectors of a disk so that they can be squeezed more efficiently.

The command format is DISKSQ X: Y:FILE.EXT, where X is the disk to be squeezed, Y is the disk which will store the squeezed disk file, and FILE.EXT is a valid DOS name for the squeezed file. Double sided 9 track disks take about 220K to 260K for full disks. (Make sure that there is enough room on the receiving disk!)

The command format for decompressing is DISKUNSQ X: Y:FILE.-EXT, where X is the disk to be restored, Y is the disk holding the FILE.EXT of the squeezed disk. The author says that the system might work for squeezing whole hard disks to a very large compressed file on another hard disk. Try it with care!

Backscroll

This is a compact little memory-resident bi-directional scrolling utility distributed as user-supported software by The Kampro Group (PO Box 90654, Honolulu, Hawaii, 96835). Fee is "about $20.00...please contribute whatever you feel Back Scroll! is worth. Even if you don't feel that Back Scroll! merits a contribution, please continue to copy and share this program with others." Now, doesn't that appeal to something in you?

Once activated, Back Scroll! will buffer the screen scrolling so that the user may recall, with a few simple keystrokes, data that has previously been scrolled off the screen. The user may either scroll by line or by page. In addition, Back Scroll!'s printer commands allow the user to select and print any data that is currently in the buffer.

Once loaded, it becomes an extension to DOS and from then on will be transparent to the user and most programs. The activation can be done at any time. The current display screen will be saved and restored so that the user may continue without any interference after scrolling back to whatever past screen of interest.

When using, a certain amount of memory must be set aside in advance. When loaded and running, the utility requires approximately 6700 bytes of memory. Another 2000 bytes are needed per screen of buffer. It is the screen buffer memory that will take the most memory and if you are not careful, may cause some problems in systems with minimal memory. The maximum number of screens is set at 28 or about 56000 bytes. Back Scroll! will default to 4 screens, or 8000 bytes, plus 6700 more for the program itself for a total overhead of about 14700 bytes.

The program is called as follows (Parm = parameter):

BACKSCRL,Parm1,Parm2

Where "Parm1" may be substituted with a number between 1 and 28 to specify the number of screen pages. If not indicated in the installation line (in AUTOEXEC.BAT or from the DOS command line), the default will be set at 4 screen pages or about 14700 bytes of memory, not too much to spare.

"Parm2" may be substituted with a number between 1 and 25 and will specify the numbers of lines Back Scroll! will page up and down through its buffer. The default is set at 25 lines or a full screen but you may wish to change it.

Once Back Scroll! is loaded, you will be returned to the DOS prompt. Except for a reduction in system memory, you may then continue using your computer normally. To summon it into play, use Control + Space Bar. To avoid interfering with the current program, the keyboard will respond normally until these keys are pressed. Once in Back Scroll!, the current operation is suspended and the display screen is saved.

When you press Control + Return, the utility will "take a picture" of the

continued on page 388

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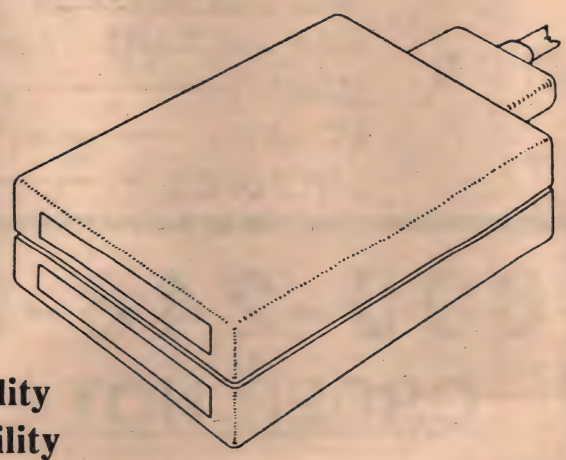

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by Stephen B. Gray

If your life is unnecessarily complicated because you have to keep referring to a large number of slips of paper for bits and pieces of information, or if you need a fast way to get through the paperwork at home, here are a couple of programs for the IBM PC (or compatible) that you might find useful.

Power Desk, from Software Studies, is a nifty desktop organizer built around a generic name-and-address database you can use to track clients, prospects and/or friends. It can do a mail merge, for printing repetitive letters automatically. It is also a word processor with a spelling checker and corrector. And it includes a calendar/reminder, calculator, and timekeeper.

W.O.R.K. At Home, created by DesignWare Plus + and published by Britannica Software, is a home-productivity tool designed to let everyone in the family type up letters, tally up numbers, or whip up phone directories. W.O.R.K. stands for Write (for word processing), Organize (a simple database), Report (integrates facts and figures) and Kalculate (with a spreadsheet).

Power Desk requires a hard drive because of the extensive filing system and the unlimited capacity of the database and associated modules (over 40 of them). So the first thing to do is to install it. A simple A:INSTALL makes Power Desk load itself, create

continued on page 389

Freeware/Shareware continued from page 387

current screen. This can be done at any time and will move the entire screen into the buffer and then return the user to the current task.

The Home key moves the cursor up one line in the buffer. If the cursor is at the top of the screen, the screen will be scrolled down one row and the top line displayed on the screen from the buffer. The End key is the opposite of the above key. The cursor is moved down or the screen is scrolled up then a line from the buffer is displayed.

I won't go into the other key operations, but they are carefully thought out, and use all the cursor arrows, and page up/down keys, grey plus and minus (go to beginning or end of buffer), PrtSc (send marked buffer to LPT1), and Space Bar (restore foreground screen).

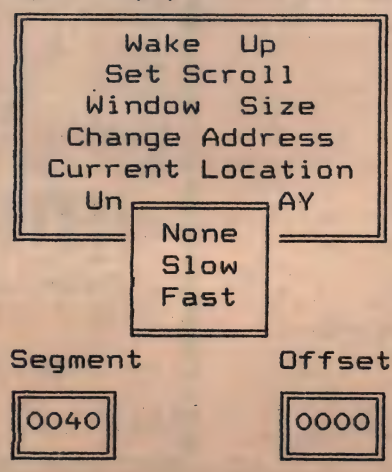
Back Scroll! may be used to "take pictures" (that is, capture screens to buffer or printer) of important data that can be recalled almost instantly for quick reference. This can be done at any time with the "Control Return" sequence. In this mode, the program compares well with other screen capture utilities compared in *Computer Shopper* recently by me.

I can't help feeling that, as a marketing system, shareware has something important to offer us, and may point the future direction for much commercial software. As the micro revolution fades into the light of common day, software will become more competitive and cheaper. The most successful shareware makers (such as Bob Wallace's PC-Write, or skads of Button-ware) have become economically viable companies. They give away the software and sell the instruction manual, updates, and support.

As software prices continue to fall to sensible levels, about the level presently of other products of intellect—books, the code will be free and the books will be sold as books are sold today. Distribution of software will move to telephone wires for free advance trial or use.

The books (expanded documentation) may also be distributed that way eventually, for the user who subscribes and offers his billing address or credit card number. That will be a swift and compelling marketing system. It will make distribution costs, physical transportation, warehousing, display, salaries and commissions or middlemen, disappear. This dimension alone will raise publisher and programmer earnings, while lowering the cost to the end user. The work of RBBS today makes these factors so obvious, the experience is getting broader every day. In the future, the implications may be irresistible! At least, that is how it looks to one observer, tra-la! ●

Figure 4—Pop-Up Menus For XRAY.COM



Get Organized
continued from page 388

its own sub-directory, and copy all required files. INSTALL also creates a batch file on the root directory, PD.BAT, so all you have to do to access the program is type PD.

Power Desk's main menu, across the top of the screen, lists the five pull-down menus, along with a counter that displays the number of active records in the name and address database, plus the current system time.

Move the cursor across the main menu, and at each stop, one of the five pull-down menus appears: Addresses, Print, Tools, Files, or Quit. Each of the five has sub-menus, accessed by moving the cursor up or down, or by keying the first letter of the option you want.

Position the cursor at the left of the screen, and you get the Addresses menu, with five functions that allow you to enter, display, mark or unmark addresses, or access "Global Marked" sub-menus.

Power Desk comes with a sample database of addresses, to be used with the 15-page tutorial. One of Power Desk's main features lets you display the addresses by name, company, zip code, record type, or date, if you're in the Display Addresses sub-menu. Move the cursor to any name, press <ENTER> and the full record for that person is retrieved and displayed.

An Auto-Dial feature lets you automatically dial the phone number in the address's telephone field, if your system has a Hayes (or similar) modem and a telephone headset.

Most of the other database features involve doing things to and with the database of names and addresses, such as marking those you want to use for printing or whatever. You can select up to five record types to be marked, by criteria such as expiration date, zip code range, or a string search.

Within the Print menu, you can do a mail merge, which puts a different name and address at the top of each printing of a letter, and which will also embed up to 16 variables in the text. Or you can print labels (up to four across) or envelopes.

The last item on the Print menu is Custom Reports, which provides some commonly used templates for rosters, phone directories, and labels, on single sheets or continuous forms. Or you can create your own template and print the database information any way you like. The latest version of Power Desk will print out a telephone directory in two-column makeup.

The Tools menu includes a full-featured word processor, which will store up to 550 lines of 80-column text in memory. All the standard WP features are included, such as file merge and line split/join, and even text encryption. The spelling checker and corrector has a 70,000-word dictionary that lets you add your own special words.

The calendar/reminder lets you keep a To Do list. The four-function (plus square root) calculator features double precision, memory display and nine decimal places, and results can be displayed in hex, binary or octal, as well as decimal. A log in/out function helps keep time records, client-filling data, telephone logs, or computer-usage logs. And you can set an alarm to remind you of an appointment or of something to do.

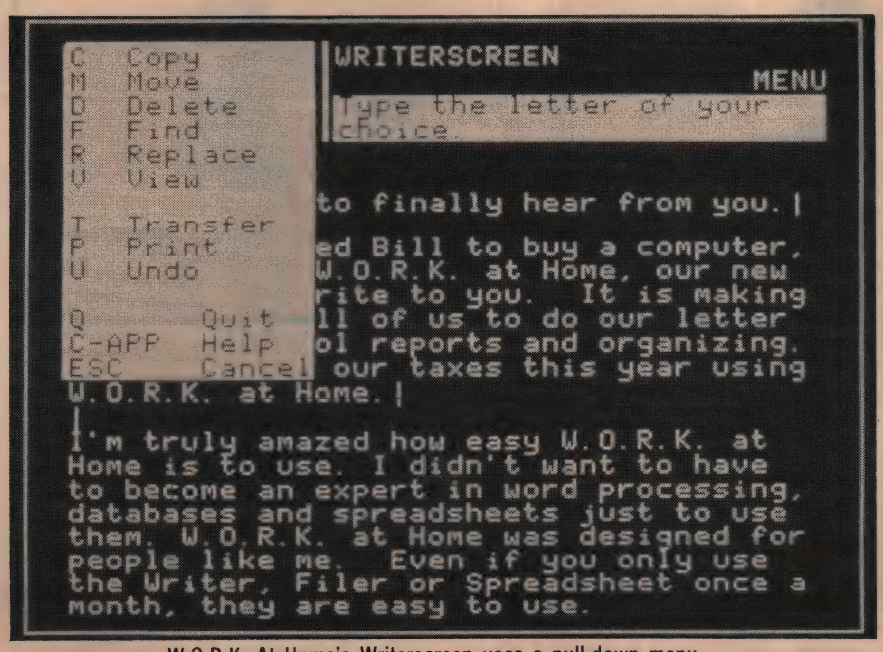
The Files menu lets you copy, rename, delete, print or view your files, import a name-and-address file from another database management system (if formatted properly), write a file for export to another database, or reset your database to null.

The Quit menu lets you go to DOS and return without reloading, change colors on the already colorful screens, quit Power Desk, or use a password to lock the system and put it on hold when you are going to be away from the console for a period of time.

The Power Desk combination of word processor, spelling checker, and name-and-address database is well worth the price, what with all the extra goodies and the easy to use menus in a user-friendly system.

Power Desk requires an IBM PC or compatible, MSDOS 2.0 or higher, a hard disk drive, 350K of memory, and a printer; the Auto-Dial feature requires a Hayes-compatible modem. Power Desk is $99 (plus $5 for shipping and

continued on page 390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I'm truly amazed how easy W.O.R.K. at Home is to use. I didn't want to have to become an expert in word processing, databases and spreadsheets just to use them. W.O.R.K. at Home was designed for people like me. Even if you only use the Writer, Filer or Spreadsheet once a month, they are easy to use.

W.O.R.K. At Home's Writerscreen uses a pull-down menu.

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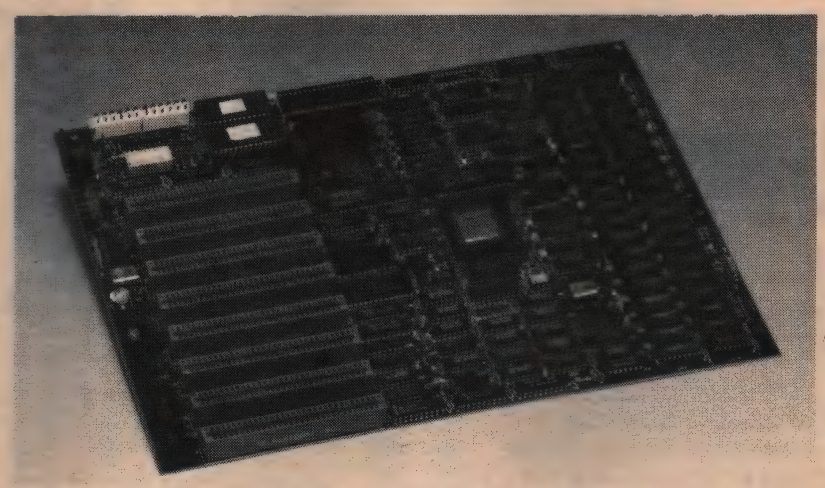

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Kyocera Laser Printers With Seven-Mode Emulation

The Kyocera Compact Laser Printers now come standard with seven emulation modes. Print quality can be upgraded without losing compatibility with favorite programs and without installing a new printer driver. These seven emulations, complete down to escape sequences and other command sets are: HP LaserJet Plus, Epson FX-80, IBM Graphics Printer, Diablo 630, Qume Sprint II, NEC Spinwriter and a generic line printer. Kyocera offers two 10 ppm (page per minute) Compact Laser Printers: the single-bin F-1000A, available for $2,895 (all prices suggested U.S. resale at participating dealers; dealer, VAR inquiries invited), and two-bin F-2010 for $4,695. The 18 ppm, two-bin F-3010 is $8,395.

Compact Laser Printers emulate the LaserJet Plus in their factory setting for full compatibility with most popular word processors, desktop publishing packages and other office applications.

Kyocera users can switch the printer's emulation from its default or current operating mode any time. Simple front-panel controls on the F-2010 and F-3010 display the current status in a large liquid crystal display. Pressing the Emulation key changes the Compact Laser Printer to a new printer mode.

Kyocera also offers users remote control of printer emulation and other features through the built-in Prescribe control language. Prescribe accepts simple English commands in plain ASCII characters to change emulation, font

continued on page 391

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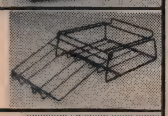

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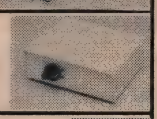

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Get Organized

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handling), from Software Studios, Inc., 8516 Sugarbush, Suite 104, Annandale, VA 22003, telephone (703) 978-2339; for orders (800) 272-3375. A version for systems without hard disk drives, called PC Desk, is $79. A demo disk of PC Desk with documentation is $25. Multi-user and network-compatible versions of Power Desk will be available in the fall of 1988.

The W.O.R.K. At Home package contains a user guide, applications guide, quick reference card, floppy with three programs (Writer, Filer, and Spreadsheet), tutorial disk, and a software product catalog.

After a short review, the user guide suggests running the tutorial, which turns out to be interactive. You're asked to press certain keys, and you can't proceed until and unless you do exactly as told, which could be frustrating for brute-force users.

The three sections of the tutorial take about half an hour to run, and cover the highlights very neatly and succinctly, and very effectively. Each of the three parts offers a full Help screen.

Writer is a simple word processor with a View function, which lets you see a page as it will look when printed. A split screen shows the full page at left, and the text of your work at right. IBM users won't be able to use the View feature without a graphics adapter card.

Writer offers the usual features of underlining, boldface, page and line counts, search and replace, and moving text.

The Filer database can store up to 360 records of 20 fields each, and you can sort on any field, in ascending or descending order. You can search for matches on one or several fields, and either edit the records found in the search or go back to editing all the records.

Spreadsheet, with 26 columns and 99 rows, is simple but effective, although rather slow when recalculating. The cells are 19 characters long, fine for labels.

All three parts offer many prompts, so that almost anyone could use them

continued on page 391

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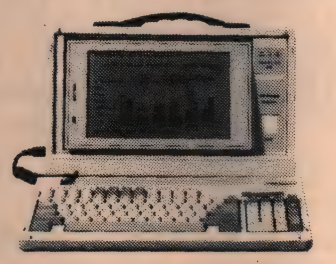

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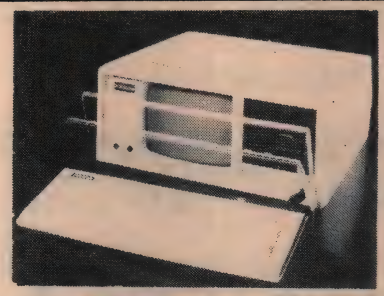

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Kyocera Laser
continued from page 390

or page orientation, for example. A user can imbed these commands within output of a word processor, database manager, spreadsheet or other application for easy control of all printer functions.

Kyocera printer drivers included in many new software packages specifically address the wealth of resident features in a Compact Laser Printer. Yet even while emulating a dot matrix, daisy wheel or LaserJet Plus printer, a Kyocera printer still lets users tap these capabilities via Prescribe commands. The programming manual included with each printer explains all Prescribe commands and the capabilities of each emulation mode.

Prescribe lets users change fonts, set margins, adjust character or line spacing, select paper supply, draw graphic effects, print barcodes and much more (according to the emulation mode). They can even read such stored images as a logo or signature and Prescibe programs to create forms from credit card size ROM cards inserted in the printer's two IC Card ports.

Compact Laser Printers offer 79 resident fonts to support its emulations and save users the expense of add-on cartridges for type versatility. These include such popular typefaces as Times Roman, Helvetica, Courier and Prestige in both portrait and landscape print modes. Each printer also provides three Dynamic fonts for scaling, rotating and modifying typefaces. Compact Laser Printers support Kyocera and HP LaserJet Plus downloadable fonts.

Both the F-2010 and F-3010 boast 1.5MB RAM standard; the F-3010 can expand to 3.5MB. The F-1000A comes with 512K RAM and can expand to 1.5MB. Each model features both serial and parallel ports, a face-down output tray on top for automatic collation of multi-page documents and side-mounted paper supply. The F-2010 and F-3010 offer dual 250-page cassettes for high-volume applications and flexible paper selection. A manual feed tray handles transparency film, labels and envelopes.

For further information contact Kyocera Unison, Inc., 3165 Adeline Street, Berkeley, CA 94703; (415) 848-6680; FAX (415) 848-7359. ●

Get Organized
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without a manual. However, some details are better learned from the manual, which offers many screen examples.

The user guide is written for Apple, IBM and Commodore computers, so every page contains a box showing which edit and function keys to use for which machine. It's a little annoying to have to refer to the box, but if separate manuals were available for each computer, the package would probably cost more.

The results of spreadsheet calculations, or any other information in the spreadsheet, can be copied to a file for use in the Writer, and may require heavy editing. Information from the Filer can also be moved to the Writer.

The 29-page applications guide contains projects designed to reinforce the user guide, with learning by using. The examples include writing, saving and printing a simple letter; writing a resume; setting up an address book; finding names in the address book; transferring the address book to a Writer file; using the Spreadsheet to budget for home improvements; setting up a table; balancing a checkbook; reformatting files; inserting a table in a report; and printing the report.

W.O.R.K. At Home has enough features to be useful to many. However, it is designed to be used at home or by a beginner, and the modest manuals and monochrome screens are rather unsophisticated. Writer is not Word Perfect by any means, nor is Spreadsheet as fancy as the higher-priced spread. Once more, you get what you pay for, which means no headers, footers, or justified text. This is an inexpensive introduction to the basics for those who don't have full access to the expensive software at the office or at school, and who don't need all the trimmings.

W.O.R.K. At Home requires an IBM PC or compatible, MSDOS 2.11 or higher, 128K of memory and a two-sided floppy disk drive; a color graphics card and a printer are recommended; $19.95 (recently reduced from $49.95), ($2.50 S&H) from Britannica Software, 345 Fourth St., San Francisco, CA 94107, telephone (415) 546-1866.

W.O.R.K. At Home is also available for the Apple II with at least 64K of memory and a floppy disk drive. ●

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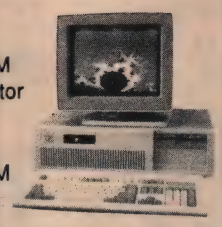

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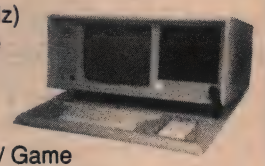

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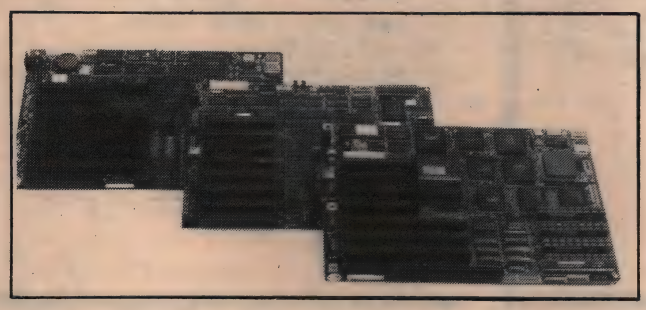

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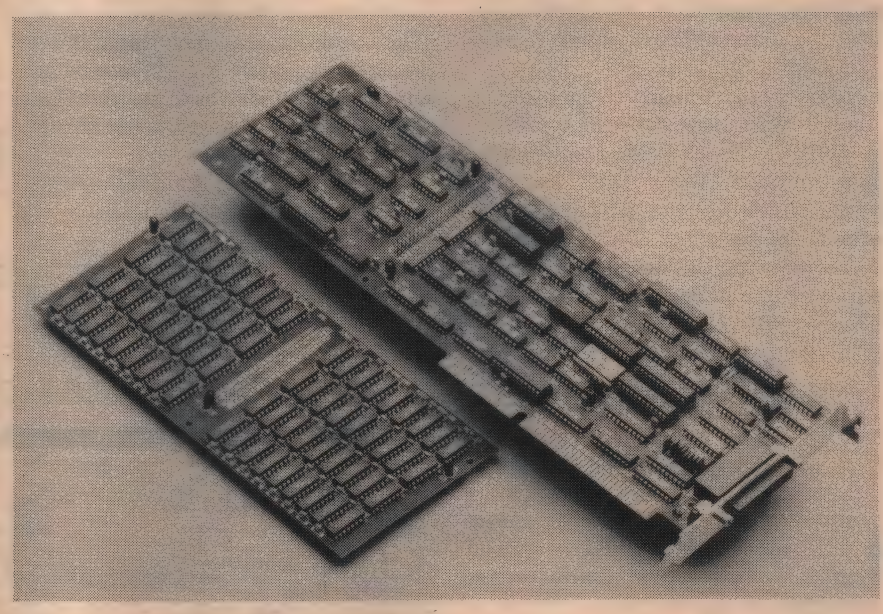

The CPI-XMA is a full-length circuit board with an attached card that increases the internal memory of the IBM PC, XT or AT, 3270 PC or the Personal System/2 Model 30 by up to 4MB, twice the memory increase offered by IBM's 2MB XMA product.

In addition, the CPI-XMA allows the standard PC/DOS or MSDOS-based machine to operate as a real-time system, and run multi-tasking operations by allocating and managing 16 selectable banks of memory.

A multi-tasking control program such as the IBM 3270 PC Control Program or IBM 3270 Workstation Program, will support the CPI-XMA, switching any of the banks into the PC address space at any given time for active use, thereby increasing the total amount of usable memory.

The adapter operates in either extended memory mode or expanded/conventional mode. CPI-XMA also includes the memory test program, XMATest, which verifies the host system setting and related settings and performs tests on memory chips. As an option, CPI-XMA offers a parallel printer port that may be defined as LPT1: or LPT2:.

IBM's recent release of MSDOS Version 4.0 incorporates the XMA capabilities and provides integrated XMA drivers. The CPI-XMA, however, provides twice the capacity of IBM's XMA board.

CPI-XMA is now available for evaluation and will be offered in both 2MB and 4MB versions. Suggested retail prices are $2,495 for the 2MB version and $3,995 for the 4MB configuration.

The CPI-XMA comes with a two-year parts and labor warranty.

For further information, contact CPI, 667 Rancho Conejo Blvd., Newbury Park, CA 91320; (805) 499-5751 or (800) 854-7600 outside of California. ●

New Commissioner's Disk For Earl Weaver's Baseball

Electronic Arts has announced the release of the Commissioner's Disk for the IBM, Tandy and compatibles. For use with Earl Weaver Baseball and Season Data Disks, the Commissioner's Disk provides players with complete control of any baseball league imaginable.

The Commissioner's Disk offers the chance to become General Manager, as players may draft and schedule a league, hire free agents, update player and team files, and trade up to five players at a time while attempting to operate a successful league. Player rosters and league schedules may be customized and printed once a team has been organized.

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While taking full advantage of being the commissioner, players may design their own ballpark or redesign the classics. Editing other components of a ballpark may also be something players choose to manage—customizing foul territory, park capacity, even wind conditions. In addition to this advanced ballpark editor, there are many new edit features for use with Earl Weaver Baseball.

Commissioner's Disk is available at local retail outlets for $19.95 or can be ordered directly from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (800) 245-4525. ●

basicstring.c continued from page 253

```
/*-------------------------------------------------------------------*/
/* strinsrt(src, des, ins, p)   Insert ins into src before position */
/*                              p.  Result goes in des.  Returns     */
                               basicstring.c
/*                              des.  p goes from 1 to strlen(src).  */
/*-------------------------------------------------------------------*/
char *strinsrt(src, des, ins, p)      int p;  char *src, *des, *ins;
{
    p =  ( p > strlen(src) )  ?  strlen(src)  :  p-1;
    return( strcat(strcat( _ncpy( des, src, p ), ins ), src + p) );
}
/*-------------------------------------------------------------------*/
/* strfnd(src, f)       Returns the position in string src where     */
/*                      string f can be found.  If not found then    */
/*                      it returns zero.  It will return a value of  */
/*                      one to strlen(src) if found.                 */
/*-------------------------------------------------------------------*/
strfnd(src, f)      char *src, *f;
{
    register    int indxs,  /* Index to src. */
                    r,      /* Return value. */
                    endv,   /* End value for loop. */
                    lenf;   /* Length of f. */

    r = 0;
    if ( (endv = strlen(src) - (lenf = strlen(f)) + 1) > 0 )
        {
        for ( indxs=0; indxs < endv  &&
                    ( *src != *f || strncmp( src, f, lenf) != 0 );
                        indxs++)
            src++;
        if ( indxs < endv )     r = indxs + 1;
        }
    return( r );
}
/*-------------------------------------------------------------------*/
/* strrpl(src, des, rpl, p)     Replace characters in string src     */
/*                              starting at position p with string   */
/*                              rpl.  Result goes in des.  p goes    */
/*                              from 1 to strlen(src).               */
/*-------------------------------------------------------------------*/
char *strrpl(src, des, rpl, p)      int p;  char *src, *des, *rpl;
{
    register    int len,        /* Length to be copied. */
                    lens;       /* Length of src. */

    if ( p > (lens=strlen(src)) )       return( strcpy(des, src) );
    if ( p + (len=strlen(rpl)) > lens + 1 )     len = lens - p + 1;
    strncpy( strcpy( des, src) + p - 1, rpl, len);
    return(des);
}
/*-------------------------------------------------------------------*/
/* _ncpy(s1, s2, n)     Same as strncpy() in normal library,         */
/*                      except it always appends a '\0' to the end   */
/*                      of the result.                               */
/*-------------------------------------------------------------------*/
char *_ncpy(s1, s2, n)  register int n;  register char *s1, *s2;
{
    register    char *r;    /* Return value. */

    r = s1;
    while ( n-- > 0  &&  (*s1++ = *s2++) );
    *s1 = '\0';
    return( r );
}
#ifdef DEBUG
/*********************************************************************/
/* Debug routine.                                                    */
/*********************************************************************/
main()
{
    char *src, des[80];     /* Source and destination string. */

    src = "Test string";
    printf( "Starting test of basicstring.c functions.\n");
    printf( "_ncpy(): should be 'Test'.  Result='%s'\n",
            _ncpy(des, src, 4) );
    printf( "strrgt(): should be 'string'.  Result='%s'\n",
            strrgt(src, 6, des) );
    printf( "strlft(): should be 'Test'.  Result='%s'\n",
            strlft(src, 4, des) );
    printf( "strmid(): should be 't s'.  Result='%s'\n",
            strmid(src, 4, 3, des) );
    printf( "strinsrt(): should be 'Test a string'.  Result='%s'\n",
            strinsrt(src, des, "a ", 6) );
    printf( "                should be 'A Test string'.  Result='%s'\n",
            strinsrt(src, des, "A ", 1) );
    printf( "                should be 'Test string!'.  Result='%s'\n",
            strinsrt(src, des, "!", 20) );
    printf( "strfnd(): should be 6.  Result=%d\n",
            strfnd(src, "str") );
    printf( "strrpl(): should be 'TEST string'.  Result='%s'\n",
            strrpl(src, des, "EST", 2) );
    printf( "              should be 'Test STRING'.  Result='%s'\n",
            strrpl(src, des, "STRING!", 6) );
    printf( "End of test of basicstring.c functions.\n" );
}
#endif
```

appleio.h

```
/*********************************************************************/
/* appleio.h                                          4/15/88        */
/*          Apple specific device drivers.                           */
/*-------------------------------------------------------------------*/
/*          Internals used by appleio.c.                             */
/*********************************************************************/
#define keybd    (* (char*) 49152)   /* Keyboard character buffer. */
#define keyclr   (1 & (* (char*) 49168))    /* Clear keyboard buffer. */

#define bttn(b)      ((* (char*) (49249+b)) > 127)   /* Button 0-2. */
#define open_apl     bttn(0)            /* Open_Apple key. */
#define clos_apl     bttn(1)            /* Closed_Apple key. */

/* Annunciator 0-3 on and off. */
#define ann_on(a)    (1 | (* (char*) (49240+2*(a))))
```

continued on page 394

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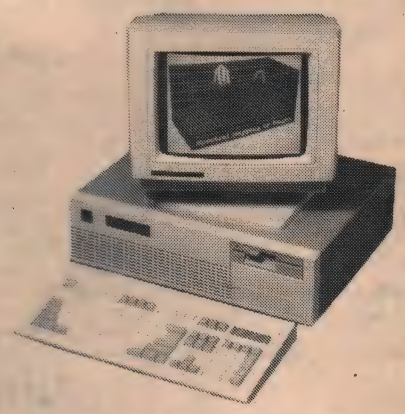

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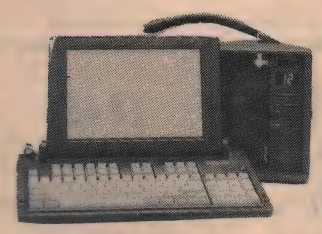

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appleio.h continued from page 393

```
#define ann_off(a)  (1 : (* (char*) (49241+2*(a))))

#define LFT_ARR     (char) 8        /* Left arrow. */
#define RGT_ARR     (char) 21       /* Right arrow. */
#define DWN_ARR     (char) 10       /* Down arrow. */
#define UP__ARR     (char) 11       /* Up arrow. */
/*************************************************************/
                                    appleio.c
/*************************************************************/
/* appleio.c                                          4/15/88  */
/*          Apple specific device drivers.                     */
/*-----------------------------------------------------------*/
/*          These functions access the keyboard, paddles       */
/*          (joystick), speaker and annuniciator switches.     */
/*          Necessaarily the code is specific to the Apple     */
/*          IIe( but not to configuration).                    */
/*************************************************************/

#include "appleio.h"
/*-----------------------------------------------------------*/
/* key()    If a key is down return it and clear strobe, if none  */
/*          then return -1.                                    */
/*-----------------------------------------------------------*/
key()
{
    register char r;

    return( ((r= keybd) > 127) ? (keyclr, (int)(r & 0x7F)) : -1 );
}
/*-----------------------------------------------------------*/
/* key_clear()      Clear the keyboard buffer.                */
/*-----------------------------------------------------------*/
key_clear()
{
   return( keyclr );
}
/*-----------------------------------------------------------*/
/* key_apple(&key)  The simultaneous press of an Apple key and a  */
/*                  regular key.                               */
/*                    Return value is -1 for no key down, 1 for    */
/*                  open-apple and key down, 2 for closed-apple and */
/*                  key down, 3 for both apple keys down and a key  */
/*                  down. Zero is returned for no apple and a key   */
/*                  down.  The value of the key is returned in &key.*/
/*-----------------------------------------------------------*/
key_apple(key)      register int *key;
{
    return( ((*key=keybd) >127 )
                ?  ( keyclr, *key &= 0x7F, apple() )
                :  -1
          );
}
/*-----------------------------------------------------------*/
/* apple()  Return 1 if the open-apple key is down, 2 if the      */
/*          closed-apple key is down, 3 if both are down and 0 if  */
/*          no apple key is down.                              */
/*-----------------------------------------------------------*/
apple()
{
    return(  ( open_apl )
                ?  (( clos_apl ) ? 3 : 1 )
                :  (( clos_apl ) ? 2 : 0 )
          );
}
/*-----------------------------------------------------------*/
/* apple_open()     Return true if open_apple key is down.    */
/*-----------------------------------------------------------*/
apple_open()
{
    return( open_apl );
}
/*-----------------------------------------------------------*/
/* apple_closed()   Return true if closed_apple key is down.  */
/*-----------------------------------------------------------*/
apple_closed()
{
    return( clos_apl );
}
/*-----------------------------------------------------------*/
/* key_arrow(&h,&v)   Return a value if an arrow key is down.  &h  */
/*                    and &v are horizontal and vertical displace- */
/*                    ment on the screen.                          */
/*                        arrow       return        &h  &v       */
/*                      ------------------------------------     */
/*                        other key     key         0   0        */
/*                        no key        -1          0   0        */
/*                        left           0         -1   0        */
/*                        right          0          1   0        */
/*                        down           0          0   1        */
/*                        up             0          0  -1        */
/*-----------------------------------------------------------*/
key_arrow(h,v)      int *h, *v;
{
    register    int r, c;
    if ( (c=key()) > -1 )
        switch (c)
            {
            case LFT_ARR:   r =  0; *h = -1; *v =  0; break;
            case RGT_ARR:   r =  0; *h =  1; *v =  0; break;
            case DWN_ARR:   r =  0; *h =  0; *v =  1; break;
            case UP__ARR:   r =  0; *h =  0; *v = -1; break;
            default:        r =  c; *h =  0; *v =  0; break;
            }
    else    {               r = -1; *h =  0; *v =  0;   }
    return(r);
}
/*-----------------------------------------------------------*/
/* paddle(n)    Return value of paddle n( 0 to 3).  If n is out of  */
/*              bounds then -1 is returned.                    */
/*-----------------------------------------------------------*/
paddle(n)       register int n;
{
    if ( n<0  ||  n>3 ) return(-1);
```

continued on page 395

appleio.c continued from page 394

```
    ;           /* This ; is necessary at this point. */
#asm
PREAD   equ $FB1E   ;Read a paddle function.
*
    ldx 128     ;Put n in X register.
    jsr PREAD   ;Read the paddle.
    sty 8       ;Put result in return register.
    ldx #0      ;Fix X back to zero.
    stx 9       ;Zero fill top of return register.
#endasm
}
/*-------------------------------------------------------------------*/
/* button(n)    Return true if button n( 0-2 ) is down.  If n is     */
/*              out of bounds then false is returned.  Note that it */
/*              is possible to modify the Apple so that a button 3  */
/*              is available.  In that case this routine will have  */
/*              to be modified.                                     */
/*-------------------------------------------------------------------*/
button(n)       register int n;
{
    return( ( n<0  ||  n>2 )  ?  0  :  bttn(n)  );
}
/*-------------------------------------------------------------------*/
/* joy(n, &x, &y)   Return x,y coords of joystick 0 or 1.  Joystick */
/*                  0 is paddle 0 and 1, while joystick 1 is paddle */
/*                  2 and 3.  If n is out of bounds then a -1 is    */
/*                  returned, else a 1 is.                          */
/*-------------------------------------------------------------------*/
joy(n, x, y)        register int n, *x, *y;
{
    if ( n<0  ||  n>1 )     return(-1);
    else{
        *x = paddle( 2*n );
        *y = paddle( 2*n+1 );
        return(1);
        }
}
/*-------------------------------------------------------------------*/
/* joystick(&x, &y, &b1, &b2)   Most Apples only have one joystick  */
/*                              and the condition of the buttons on */
/*                              that joystick are used.  This rou-  */
/*                              tine returns those values. The x,y  */
/*                              coords are &x,&y and the button     */
/*                              values are &b1,&b2( !=0 is on).     */
/*-------------------------------------------------------------------*/
joystick(x, y, b1, b2)      int *x, *y, *b1, *b2;
{
    *x = paddle(0);
    *y = paddle(1);
    *b1 = bttn(0);
    *b2 = bttn(1);
}
/*-------------------------------------------------------------------*/
/* bell(len,tone)   Modified bell routine from ROM.  len specifies  */
/*                  the length of the tone and tone specifies sound.*/
/*                  See the code at $FBDD and $FBE6 in ROM.         */
/*                  For the same sound as bell use len=192 and      */
/*                  tone=12.                                        */
/*-------------------------------------------------------------------*/
 bell(len,tone)     int len, tone;
{
#asm
SPKR    equ $C030   ;Speaker
WAIT    equ $FCA8   ;Wait for a time.
*       ldy #9      ;Get len.
        lda (4),Y
        sta ln+1    ;   Put len in routine.
        ldy #11     ;Get tone.
        lda (4),Y
        sta tn+1    ;   Put tone in routine.
ln      ldy #$C0
tn      lda #$0C    ;Make a tone.
        jsr WAIT
        lda SPKR
        dey
        bne tn
#endasm
}
/*-------------------------------------------------------------------*/
/* annun_on(n)  Turn annunciator n(0-3) on.  If n is out of bounds  */
/*              then a -1 is returned else a 1 is returned.         */
/*-------------------------------------------------------------------*/
annun_on(n)     register int n;
{
    return(  ( n<0  ||  n>3 )  ?  -1  :  ann_on(n) );
}
/*-------------------------------------------------------------------*/
/* annun_off(n)     Turn off n(0-3) annunciator.  If n is out of    */
/*                  bounds then return -1 else return 1.            */
/*-------------------------------------------------------------------*/
annun_off(n)        register int n;
{
    register    char c;
    return(  ( n<0  ||  n>3 )  ?  -1  :  ann_off(n) );
}
#ifdef DEBUG
/*********************************************************************/
/* DEBUG routine                                                     */
/*********************************************************************/
#define PAUSE(t)    for(h=1; h<t; h++)  /* Wait for a bit. */
main()
{
    char c;     /* Return values. */
    int r,h,v, b1, b2;
    printf("Starting test of appleio.c routines.\n\n");
    key_clear();
    printf("key, key_clear: Press a key. \n");
    while ( (r=key()) < 0 ) ;
    printf("                Key was %c.\n", (char) r);
    printf("key_apple: Press an apple-key and any other.\n");
    while ( key_apple(&c) < 1 ) ;
    printf("             Key was %c.\n", c);
    printf("apple_open: Press the open-apple key.\n");
    while ( !apple_open() ) ;
```

continued on page 396

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appleio.c continued from page 395

```
    printf("apple_closed: Press the closed-apple key.\n");
    while ( !apple_closed() );
    printf("key_arrow: Press any arrow key.\n");
    while ( key_arrow(&h,&v) != 0 ) ;
    printf("            horizontal=%d  vertical=%d.\n\n\n", h, v);

    printf("Use a joystick for the following.\n");
    printf("paddle,button,joy:  Press a button when done.\n");
    do  {
                              appleio.c
        joy(0, &h, &v);
        printf("                horizontal=%3d  vertical=%3d.\r", h, v);
        }  while ( !( button(0) | button(1) ) );
    printf("\n\njoystick: Press a button when done.\n");
    do  {
        joystick(&h, &v, &b1, &b2);
        printf("       horizontal=%3d  vertical=%3d.\r", h, v);
        }  while ( !( b1 | b2 ) );
    printf("\n\nbell:  Three sounds.\n");
    bell(200, 20);
    PAUSE(500);
    bell(100, 50);
    PAUSE(500);
    bell(200, 10);
    printf("annun_on: Zero switch is now on.\n");
    annun_on(0);
    PAUSE(25000);
    printf("annun_off:  Zero switch is now off.\n\n");
    annun_off(0);
    printf("End of test of appleio.c routines.\n");
}
#endif
/*****************************************************************/
```


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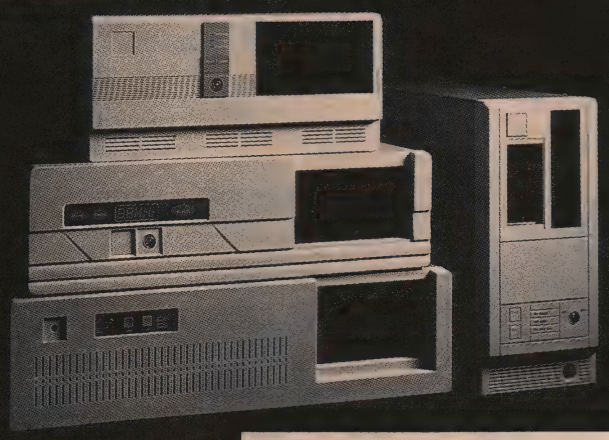

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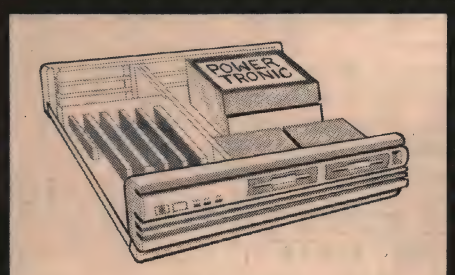

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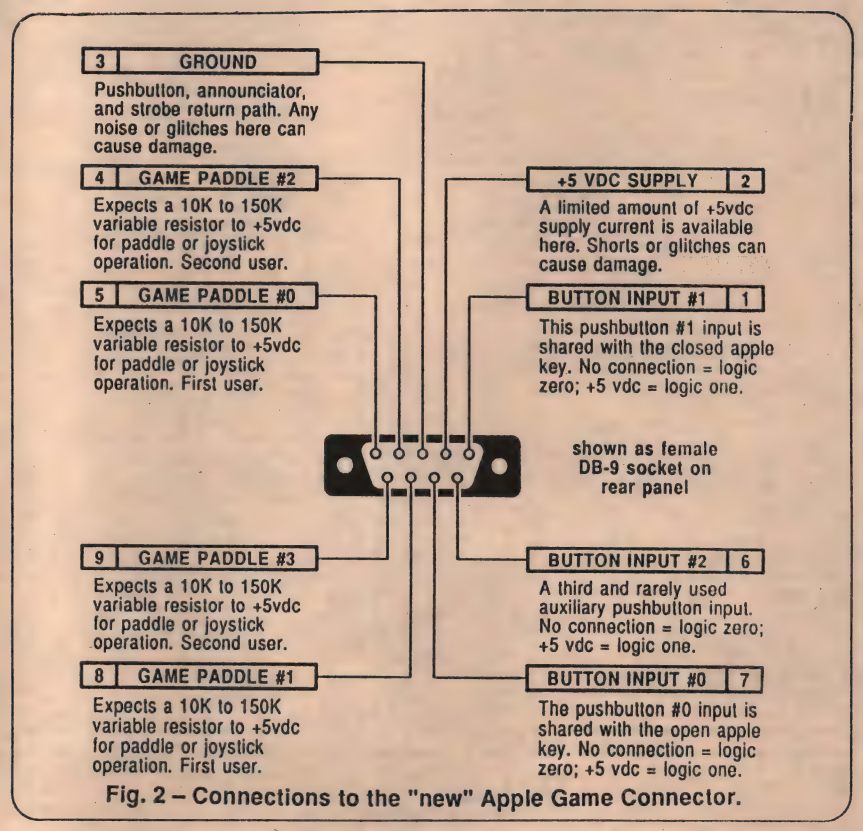
Ask The Guru
continued from page 252

This lets you use much more rugged connectors on your paddles and joysticks, and now did let you plug or unplug without taking the machine apart. On the other hand, it dropped the four annunciator outputs and the strobe, and all of those really neat "quick and dirty" I/O tricks you could do with them.

Figure 2 shows you this "new" game socket and its connections.

The Apple IIe did give you both connectors and let you have the best of both possible worlds. In theory, so did the IIgs. Only early versions of the IIgs left off the strobe output for some inexplicable reason. Strobe just plain is not there. Hopefully, this will someday be restored.

continued on page 397


3 GROUND
Pushbutton, announciator, and strobe return path. Any noise or glitches here can cause damage.
4 GAME PADDLE #2
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. Second user.
5 GAME PADDLE #0
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. First user.
+5 VDC SUPPLY 2
A limited amount of +5vdc supply current is available here. Shorts or glitches can cause damage.
BUTTON INPUT #1 1
This pushbutton #1 input is shared with the closed apple key. No connection = logic zero; +5 vdc = logic one.
shown as female DB-9 socket on rear panel
9 GAME PADDLE #3
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. Second user.
8 GAME PADDLE #1
Expects a 10K to 150K variable resistor to +5vdc for paddle or joystick operation. First user.
BUTTON INPUT #2 6
A third and rarely used auxiliary pushbutton input. No connection = logic zero; +5 vdc = logic one.
BUTTON INPUT #0 7
The pushbutton #0 input is shared with the open apple key. No connection = logic zero; +5 vdc = logic one.
Fig. 2 – Connections to the "new" Apple Game Connector.

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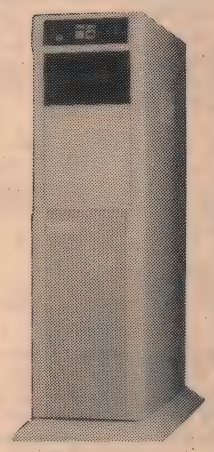

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Ask The Guru
continued from page 396

At any rate, you might like to use old paddles on a new machine or vice versa. Figure 3 (page 410) shows you the two adapters you will need to either get from the old paddles to a new connector, or from new paddles to an old connector.

Since the "old" IIgs game paddle connector is far and away the fastest way of doing your 57600 baud serial LaserWriter communications (this is insanely faster than is use of AppleTalk), there seems to be a bunch of renewed interest in what you can really do with that internal game connector. More on this whenever.

One tip: If you are still using the "old" paddles or joysticks, add a 16 pin machined pin contact DIP socket to the pins. This can then safely be plugged into the motherboard. Now, when (not if) the pins bend or break off, all you have to do is snap on another DIP socket, rather than taking the paddle or joystick apart and trying to fix it.

Another tip: If you are reading a pair of paddles or a joystick from machine language, be sure to wait several milliseconds between your successive paddle or joystick reads; otherwise, you can get some strange interaction between the two paddles or the joystick "X" and "Y" axes.

Tell Me About Hot Stamping

Our never ending quest for weirder and more bizarrely wonderous "neat stuff" goodies for laser printers has finally led us around to hot stamping.

While you can use Omnicolor or Kroy Kolor to fake a hot stamping, the real thing is far more durable and far more impressive.

Hot stamped foil consists of a thin and brightly colored film or foil to which a thin layer of high temperature adhesive had been attached. You press a stick of type or else a steel or silicon rubber die against the foil and quickly heat it. The heat and pressure then transfers the foil to the paper or other substrate. The cost is around a dime a square foot.

Obvious uses do include business cards, book covers, announcements, ad displays, and greeting cards. Or anywhere else you want to impart a high quality image.

Hot stamping is sometimes combined with embossing or debossing, often with spectacular results.

Here's what I have found out so far: Sources of foil and hot stamping machines advertise regularly in both Paper, Film, and Foil Converter and in Package Printing and Converting magazines. A house newsletter with one incredible title is *Foiled Again* and is published by Transfer Print Foils; these people also supply a product called All Purpose Roll Leaf.

Some of their competitors include Maple Roll Leaf, Coburn, Lamart, Identicolor and Hoechst/Hostaphan. Finally, those Bind-It people have a desktop Foil-It system that does seem obscenely overpriced at $800, but is otherwise interesting.

I have this strange feeling that I am only scratching the surface somewhere way out in left field. So, why don't you tell me about sources and supplies of foil stamping, or of the many brand new things that you can do with them that does involve laser printing? We'll have another one of our stupid contests. An Incredible Secret Money Machine for the best twenty entries, and an all expense paid (FOB Thatcher, AZ) tinaja quest for two for the best response of all.

What Is This Month's PostScript Utility?

Two of the real beauties of the PostScript language are that it is both threaded and extensible. This means you can add any new commands you want to the language any time you wish. The only rule is that you have to define any of your new commands by using combinations of previously defined ones.

So, what I have come up with is a new nuisance dictionary that makes doing great heaping bunches of tricky things (such as turning off that test page) easily done with a single command. What you do is persistently download this dictionary or else tack it onto anything else you are persistently downloading on power up.

From that point forward, you can activate all of these new commands with a simple nuisance begin.

Figure 4 (page 410) shows you a detailed list and explanation of what all the nuisance commands do, while Figure 5 (page 411) will give you all of the working code ready to download.

Included are new trig commands for the tangent, arccosin and arcsin; one-word choices for backwards, feet first, frontwards, and landscape printing; ex-

continued on page 410

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Random Numbers
continued from page 252

or more dice, which all have the same number of sides, will produce a curve that looks like that. So three six sided dice can be used to produce numbers that reflect on how the real world works.

So now that I have figured out the reason for using three six sided dice, how do I use them on my computer. Unfortunately, my computer doesn't have a mechanical arm and eyes to roll the dice during a game. However, the following function produces the same thing.

```
DEF FN D(X)=INT (RND (1) * 6) + INT (RND (1) * 6) +
            INT (RND (1) * 6) +3
```

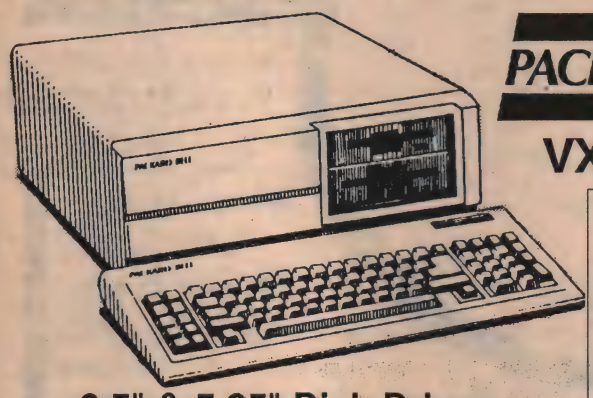
Since I was most interested in games I decided that I might as well write at least a short one which would use the principle of the curve by using dice. The result is the FINAL.ARENA as shown in Listing 2. The idea is simple. Two gladiators are going to fight it out in an arena. It can be played either by one player picking both fighters or two players each picking one. After one of the fighters dies you can start over again using several options. The first option allows you to start with new fighters. The second option allows the same fighters, both alive and fully healed, to choose new weapons (and armor) before fighting again. The third option

continued on page 399

FINAL.ARENA

```
10  REM  *** FINAL.ARENA *** By Joe Schell * 4/4/87
20  REM  A demonstration of the use of three dice in
30  REM  a simple melee combat system.
40  DEF  FN D(X) =  INT ( RND (1) * 6) +  INT ( RND (1) * 6) +  INT ( RND (1)
          * 6) + 3
50  REM  *** MAIN CONTROL LOOP ***
60  TEXT : HOME
70  PRINT  SPC( 20)"The Last Arena"
80 SC = 39
90  GOSUB 230
100  GOSUB 540
110  GOSUB 930
120  GOSUB 210
130  PRINT "1) Choose new fighters.  2) Choose new weapons.  3) Fight again."
140  INPUT "4) Quit.    Choice:";X$
150 X =  VAL (X$): IF X > 4 OR X <  >  INT (X) THEN 120
160  ON X + 1 GOTO 120,90,100,110
170  GOSUB 210
180  PRINT "So, the fighters retire for the moment, but the arena always
          waits."
190  END
200  REM  Clear line for message
210  VTAB 20: HTAB 1: PRINT : PRINT  CHR$ (11): RETURN
220  REM  *** CREATE FIGHTERS ***
230  GOSUB 210
240  INPUT "Name of one gallant fighter:";N$(1)
250  GOSUB 210
260  PRINT "And the name of "N$(1);
270  INPUT "'s worthy opponent:";N$(2)
280  GOSUB 210
290  VTAB 3: PRINT N$(1);: POKE 36,SC: PRINT N$(2)
300  PRINT
310 X$ = "Strength---": PRINT X$;: POKE 36,SC: PRINT X$
320 X$ = "Agility----": PRINT X$;: POKE 36,SC: PRINT X$
330 X$ = "Body-------": PRINT X$;: POKE 36,SC: PRINT X$
340  GOSUB 210
350  INPUT "( A voice speaks from the air) 'Select a magic number?'";X$
360 X =  VAL (X$): IF (X = 0) AND (X$ <  > "0") THEN 340
370 X =  RND ( - 1 * ( ABS (X) +  RND (X)))
380  FOR X = 1 TO 6:AB(X) =  FN D(X):CA(X) = AB(X): NEXT
390  GOSUB 470
400  GOSUB 210
410  INPUT "Are you satisfied with your selection( yes or no)?";X$
420  IF  LEN (X$) THEN X$ =  LEFT$ (X$,1)
430  IF X$ = "N" OR X$ = "n" THEN 340
440  IF (X$ <  > "Y") AND (X$ <  > "y") THEN 400
450  RETURN
460  REM  * PRINT ATTRIBUTES *
470  FOR X = 1 TO 5 STEP 2
480  VTAB 5 + (X - 1) / 2
490  FOR Y = 0 TO 1
500  POKE 36,SC * Y + 13: PRINT "("AB(X + Y)") "CA(X + Y)"   ";
510  NEXT : NEXT : PRINT
520  RETURN
530  REM  *** CHOOSE A WEAPON ***
540  VTAB 9: HTAB 1: PRINT  CHR$ (11): PRINT "WEAPONS:"
550  RESTORE
560  READ NW
570  FOR X = 1 TO NW
580  READ W$(X),MS(X),MA(X)
590  PRINT X") "W$(X)
600  NEXT X
610  VTAB 10: POKE 36,SC: PRINT "ARMOR:"
620  READ NA
630  FOR X = 1 TO NA
640  READ AR$(X),BP(X),AM(X)
650  POKE 36,SC: PRINT  CHR$ (64 + X)") "AR$(X)
660  NEXT
670  FOR F = 1 TO 2
680 W(F) = 1:A(F) = 1
690  GOSUB 840
700  GOSUB 210
710  PRINT N$(F);
720  PRINT " pick a weapon( by number) or armor( by letter) or quit(Q):";: GET
          X$
730  IF X$ = "Q" OR X$ = "q" THEN 820
740 X =  VAL (X$): IF X > NW THEN 700
750  IF X < 1 THEN 780
760 W(F) = X
770  GOTO 810
780 X =  ASC (X$) - 64 - 32 * ( ASC (X$) > 96)
790  IF NA < X OR X < 1 THEN 700
800 A(F) = X
810  GOSUB 840: GOTO 700
820  NEXT : RETURN
830  REM  * CALCULATE CURRENT ABILITIES *
840 CA(F) = AB(F)
850 CA(F + 2) = AB(F + 2) - MA(W(F)) - AM(A(F)): IF CA(F + 2) < 3 THEN CA(F +
          2) = 3
860 CA(F + 4) = AB(F + 4) + BP(A(F))
870  REM  PRINT CURRENT STATISTICS
880  GOSUB 470
890  VTAB 8: POKE 36,SC * (F - 1): PRINT  CHR$ (29)
900  VTAB 8: POKE 36,SC * (F - 1): PRINT W$(W(F))"   "AR$(A(F))
910  RETURN
920  REM  *** DUEL ***
930  VTAB 9: HTAB 1: PRINT  CHR$ (11)
940  FOR F = 1 TO 2: GOSUB 840: NEXT
950  IF CA(3) = CA(4) THEN FA = 1 + ( FN D(X) > 10): GOTO 970
960 FA = 1 + (CA(3) < CA(4))
970  GOSUB 1070
980  IF  NOT (MISS) THEN  GOSUB 1140
990  GOSUB 1240
1000  IF CA(7 - FA) > 0 THEN FA = 3 - FA: PRINT : PRINT "(Hit a key for the
          next round)": GET X$: GOTO 970
1010  PRINT N$(3 - FA)" has breathed his last."
1020  PRINT
1030  PRINT "And as the body of ";N$(3 - FA)" is carried from the field,"
1040  PRINT N$(FA)" steps forward to receive the"; MID$ (" acclaim distain",1
          + 8 * ( FN D(X) > 10),8)" of the crowd."
1050  RETURN
1060  REM  * SWING AT HIM *
1070 MISS = ( FN D(X) > CA(FA + 2))
1080  VTAB 11: HTAB 1: PRINT  CHR$ (11);
1090  PRINT N$(FA)" swings and it ";
1100  IF MISS THEN  PRINT "misses.": GOTO 1120
1110  PRINT "looks good";
1120  RETURN
1130  REM  * DOES IT HIT? *
1140 HIT = ( FN D(X) >  = CA(5 - FA)):DM =  FN D(X): IF DM > CA(FA) THEN DM =
          CA(FA)
1150  IF  NOT (HIT) THEN  PRINT ", but it is parried.": GOTO 1220
1160  PRINT "."
1170 DM =  INT (DM / 3) + MS(W(FA))
1180  PRINT "It does"; MID$ (" little some much",1 + 7 * (DM > 3) + 5 * (DM >
          6),7 - 2 * (DM > 3))" damage to ";N$(3 - FA)"."
1190 CA(7 - FA) = (CA(7 - FA) - DM) * (CA(7 - FA) - DM > 0)
1200  GOSUB 470
1210  VTAB 13: HTAB 1: PRINT
1220  RETURN
1230  REM  * THE FICKLE CROWD *
1240  PRINT "The crowd is ";
1250  ON  INT (( FN D(X) - 2) / 4) GOTO 1260,1270,1280,1290
1260  PRINT "screaming for the blood of";: GOTO 1300
1270  PRINT "calling for the head of";: GOTO 1300
1280  PRINT "cheering wildly for";: GOTO 1300
1290  PRINT "chanting the name of";
1300  PRINT " ";N$(1 + ( FN D(X) > 10))"."
1310  RETURN
3000  REM  WEAPON DATA
3010  REM  Number of weapons
3020  DATA  5
3030  REM  Format for Weapon DATA:
3040  REM  -Name-, -attack bonus-, -minus to Agility-
3050  DATA  no weapon,0,0
3060  DATA  Light Foil,1,1
3070  DATA  Sword,2,2
3080  DATA  Hand Axe,1,1
3090  DATA  Two-handed sword,3,3
4000  REM  ARMOR DATA
4010  REM  Number of types of armor
4020  DATA  4
4030  REM  Format for Armor DATA:
4040  REM  -Name-, -Body points absorbed-, -minus to Agility-
4050  DATA  no armor,0,0
4060  DATA  Leather,1,1
4070  DATA  Chainmail,2,3
4080  DATA  Plate,4,6
```


Finally! A Better Mousetrap.



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Random Numbers continued from page 398

allows the fighters a rematch with the same weapons and armor and fully healed. And finally the fourth option is to exit from the game.

Each fighter starts out with three attributes. These will change depending on what magic number is picked. The attributes are strength, agility and body. Strength represents how much damage a fighter will do as modified by the weapon that he is using. Agility determines how often a fighter will be able to hit and parry the other fighter. Finally body represents how many hits a fighter can take before he dies. Armor will modify that though.

The program itself is broken into subroutines. For the most part they are self explanatory and short enough that no other explanation is needed. However, you will need to have an 80 column screen active.

The magic number that you must pick is used to provide a seed for the random number generator. Additionally the statement that follows needs some explanation.

POKE 36, Expression

It is used because I am using the older version of the Apple IIe. That means I cannot use the HTAB (Horizontal Tab) statement in 80 columns. It won't make any difference for the operation of the program, but for those who do have the newer Apple IIe the POKE can be replaced by HTAB, if it is desired. However, if that is done then every expression with the POKE will have to have +1 added to it.

This program can be modified in a number of ways. Probably the most significant would be in modifying the relationship between weapons and agility. Right now, the agility attribute is far too significant. However, if bigger weapons did more damage then that would help counter that.

One way to do this would be to make each weapon represent so many n-sided dice. The following function would represent this.

```
DEF FN DN(N)=INT (RND (1) * N) + INT (RND (1)
             * N) +
             INT (RND (1) * N) + 3
```

For instance a light foil could be represented by N = 3 which would be the equivalent of rolling three three-sided dice. And then a two-handed sword could be N = 10 which, of course, would represent rolling three ten-sided dice. Given that the rest of the game is about the same then it would probably only take one hit with a two-handed sword to finish off any other fighter.

Also armor only adds points to the body. However, armor should actually protect a fighter every time he is hit. To do that the protection from armor (two for chain mail) would be subtracted from the damage, DM in line 1170, every time.

Another change would be to allow each player to select the number for each attribute. The first way to do this is to have each attribute start at eight (slightly above average) and then have an additional number of points, perhaps eight, to divide up any way the player wants. The second way would still have eight points for the player to divide up, but the starting attributes, instead of being all eight, would be randomly selected first.

As it is now a fighter gets to attack and parry at the same time. This is rather unrealistic and it would be more appropriate if the player were allowed to choose whether to parry or hit at any given time.

Lastly, the subroutine called The Fickle Crowd at line 1230 should be looked at just because of the way in which it selects the mood of the crowd. It, too, could be changed and added to. However, more importantly, it demonstrates a way in which a mood can be picked for anything. For instance it would be simple to add this into another game in which I could encounter a hamster which is passive, gentle, nippy or a vicious ravening beast. And naturally a grizzly could be done in the same way although it would probably be something like not interested, mean, meaner and meanest. After all most grizzlies aren't too friendly.

Although this game is amusing for a while I did intend for it to be modified a great deal. For me it is just too simple to hold my attention for long. But changing it and then testing the result can, and has, held my attention for days. However, it has accomplished its purpose in demonstrating the use of the curve in something more exciting than grading papers. ●

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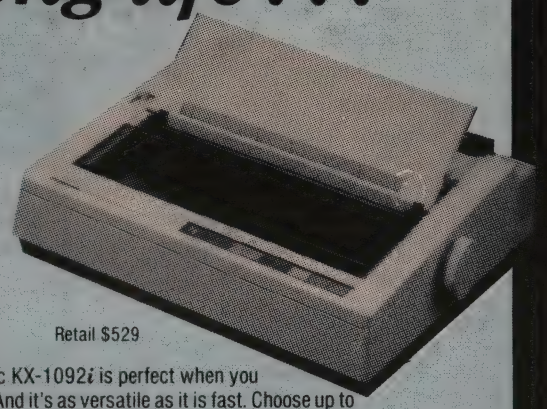

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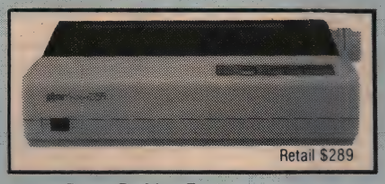
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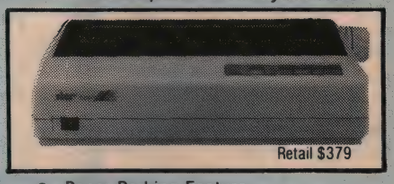
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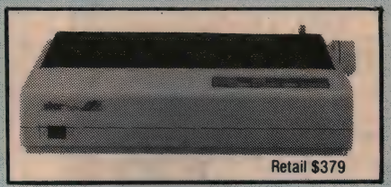
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Soaring With Wings Of Fury

by Richard T. Craft

The flight deck of the U.S.S. Wasp bobs insidiously before me, beckoning to toss my F6F Hellcat fighter into the cold waters of the Pacific Ocean. As I cinch myself in the cramped cockpit, I look up to see a cloudless sky and momentarily contemplate what lies ahead. I've flown these missions many times, yet each time is different as the enemy always has surprises in store. The signal officer motions that it's time. I throttle the engine to full and the plane bolts forward. The flight deck quickly gives way to crashing waves. As I pull back on the joystick to gain precious altitude, I briefly peer back to see the comfort of safety rapidly disappearing. My eyes return forward to spot a lush, jungled island sprayed out below me. The next second I'm greeted by the orange flame of anti-aircraft fire spewing forth from a sand-bagged emplacement strategically placed at the end of a clearing carved out of the palm trees. I immediately target what lay just beyond the ferocious gunfire. With precision timing I unleach my first load of bombs over two barracks below. Thundering explosions behind me are all I need to know that I was on target. No time to think as I pull up to avoid another AA emplacement placed on the opposite side of the clearing. Too late! Gunfire tears into my trusty 'Cat. The plane begins to bleed whiffs of smoke. A quick glance at the dropping oil gauge confirms that I sustained a critical hit. Keeping the joystick pulled back, I gain altitude. Below, the orange flames continue following me.

On the ground are scurrying figures pouring from the demolished barracks, running in all directions. In one motion, I shove the joystick forward and to the right and go into a screaming power dive. The force imprints my body contours into the seat. I manage to press the trigger button unleashing my six .50 caliber machine guns. The ammunition slams into the ground uprooting everything in its path. I skim the palm trees at the edge of the clearing leveling off just above an AA emplacement and make a deposit.

"That'll teach 'em for putting holes in my 'Cat," I thought. With guns still open, it traced a path of destruction spewing sand and whatever else got in its way. I pulled up again noticing that there was a lone figure manning the remaining AA gun.

"Only one more chance," I said to myself as the oil gauge winked its red warning light at me. High above the island I release my last payload. A cluster of bombs fall in unison and seconds later there is no more orange flame from the ground.

Mission completed, I tend to my Hellcat, smoke now pouring from the engine. Luckily the flat top is not far off because I can no longer hold my altitude. I pass over the carrier and make a sharp turn into the wind. With the oil pressure at a critical point I know that there can only be one attempt to land my 'Cat. The flight deck bobs and I compensate as best as I can. I pass over the first arrestor cable and barely miss the second one. The third cable grabs my arrestor hook and I'm thrown forward in my seat. I sigh a breath of relief as I taxi toward the elevator.

Wings of Fury is an arcade style game consisting of excellent graphics and smooth scrolling action that Broderbund has become known for. It enables the player to become a World War II Navy Air Force pilot doing duty among the scattered islands of the Pacific Theater. Not an actual flight simulator per se, Wings of Fury places you at the controls of one of America's most versatile planes of the War, the F6F Hellcat. Using a joystick, the controls are kept simple allowing the player to concentrate on game play. A control panel at the bottom of the screen displays a weapon counter, planes remaining counter, oil gauge, artificial horizon indicator, fuel gauge and score counter. The player is not overwhelmed with countless gauges and difficult controls. The view is not from the cockpit as with a standard flight simulator, but rather from a third person vantage point outside the plane. All this makes for quick learning and allows the player to hone his or her skills in order to compete in one of the seven levels of play.

The major objectives of the game include devastating island strongholds and sinking enemy ships using bombs, rockets and torpedoes. Aerial dogfighting skills are necessary at the higher levels of play as enemy aircraft will relentlessly tail your Hellcat and fire upon you every opportunity they get.

The player is given three planes to start with and earns more as progress is made to the next rank. The F6F is capable of carrying 30 bombs, 15 rockets or 1 torpedo at a time. When these are expended on a mission, the player returns to the carrier to reload. That is, if the player can land back on the aircraft carrier. As in reality, this is not the simplest task. With lots of practice though, this can be mastered. Landing safely also allows refueling and repair if needed.

You're not limited to offensive strikes in Wings of Fury. You'll have to defend your aircraft carrier from enemy torpedo bombers by shooting them down or destroying an oncoming torpedo. Overall, game action is interesting and the challenge continues as the player progresses with each rank. Oh, one final item—try flying "around the world." Of course you'll run out of fuel eventually, but before that you'll encounter the "Broderbund Triangle." Try it! ●

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Easy Desktop Publishing Designed For Children

The Learning Company has introduced The Children's Writing & Publishing Center for youngsters ages nine and up. The Children's Writing & Publishing Center combines popular word processing and desktop publishing features in a program that helps build and develop written communication skills. The product, available this fall, runs on all Apple II computers, including the Apple IIgs, IIe and IIc.

With an emphasis on ease of use, The Children's Writing & Publishing Center is designed to stimulate the natural creativity of children and make writing both fun and rewarding. The product combines powerful features in word processing, picture selection and page design to help children produce first-class illustrated reports, letters, stories, newsletters and more.

Through a series of multiple features, users can combine words and pictures readily; automatically wrap words around pictures that are placed in documents; cut and paste text; use multiple font styles, sizes and proportional spacing; use one or two column formats; and insert over 150 pictures from the program as well as art from the leading graphics libraries. The Children's Writing & Publishing Center also supports dot matrix black and white or color printers.

Ease of use is accomplished through colorful icon menus, a What You See Is What You Get display, easy to read screens, page format samples and on-line help. In addition, easy to follow instructions are available on-line and off-line to coach new users every step of the way.

The Children's Writing & Publishing Center is accompanied by a comprehensive user's guide which provides look-up details and step-by-step instructions, reference information, a troubleshooting section and index. It also includes a sample letter which quickly gets new users into the program in an easy to follow and fun exercise.

The Children's Writing & Publishing Center package for 5.25" formats includes a program disk, a picture disk and a storage disk for saving text. The 3.5" format includes a program/picture disk and a storage disk.

The Children's Writing & Publishing Center is priced at $59.95 for the consumer edition. A school edition was scheduled to be available in October, priced at $79.95. As with other school editions from The Learning Company, it will include the program disk and a back-up program disk, storage disk with sample templates designed for classroom use, scope and sequence chart, blackline masters, off-line activities and other teaching materials.

In addition to the Apple II version, an MSDOS compatible version of The Children's Writing & Publishing Center will be available later this fall.

For further information, contact: The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555; (415) 792-2101. ●

Jigsaw!

Britannica Software, and Encyclopaedia Britannica Company has announced the publication of Jigsaw!, The Ultimate Electronic Puzzle.

Jigsaw!, The Ultimate Electronic Puzzle has over 20 diverse full color puzzle images to choose from ranging from famous sites around the world, art masterpieces, the alphabet, animals and landscapes. The player can select from the number of puzzle pieces in the game: 60, 40 (most complex), 15 and 8 (easiest). It can be played alone or with multiple partners. Children will develop better shape recognition skills and adults will enhance their visual memory. Jigsaw! also allows the consumer to print out a completed colorful puzzle!

Jigsaw! is designed for the Apple IIgs with 512K of memory. The program was scheduled to be shipped in late August at a suggested retail price of $39.95, and includes an image disk, full of 20 or more vibrant images. Additional image disks can be purchased for $24.95.

For further information, contact: Britannica Software, 345 Fourth St., San Francisco, CA 94107; 415-546-1866. ●

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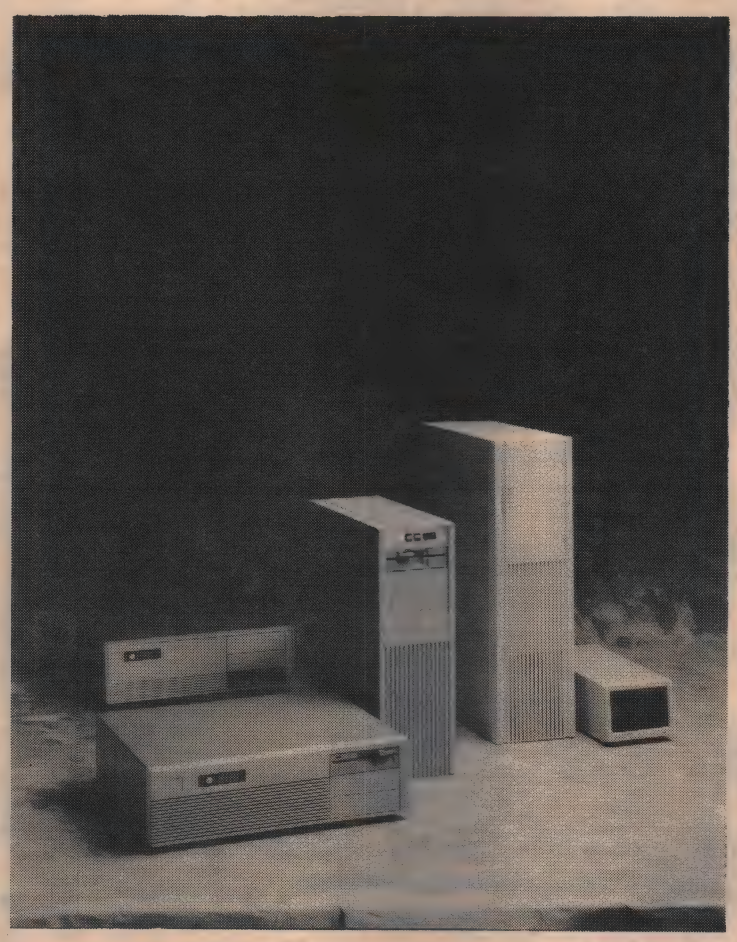

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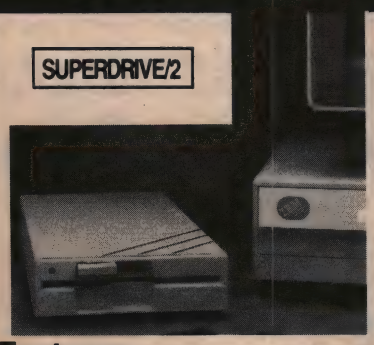

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PostScript-Compatible Page Printer At Lower Cost

Crystal Print Publisher Laser Printer

The CrystalPrint Publisher, a PostScript-compatible page printer which provides the same level of text and graphics processing speed as Apple's top of the line LaserWriter IINTX but priced lower than the LaserWriter IINT, has been introduced by Qume Corporation.

With a $4,499 suggested retail price (SRP), the Publisher features a printer-resident Reduced Instruction Set Computing (RISC) architecture printer controller utilizing the new Weitek Corporation ultra-high performance HyperScript-Processor XL-8200 chip set to establish new price/performance standards for page printing in the PostScript environment.

In addition to its price/performance advantages over the LaserWriter IINTX and other PostScript printers, the Publisher comes standard with 3MB of RAM. This allows for continuous text printing as well as provides more downloadable fonts for enhanced user flexibility.

As with other CrystalPrint page printers, the Publisher features the smallest footprint (15.7"Wx13.4"D x9.1"H) in the page printer market. Combining a third-generation page printer engine from Casio Computer Co., Ltd., with the Qume printer controller, the Publisher has a print resolution of 300x300 dots per inch which provides solid blacks for graphics printing and subtle, well-formed characters when printing text.

Eleven built-in font families, offering 35 typefaces, come standard with the Publisher. The fonts include Bitstream Dutch (Times equivalent), Bitstream Swiss (Helvetica equivalent), Courier, Symbol, ITC Avant Garde Gothic, ITC Bookman, New Century Schoolbook, Bitstream Swiss Narrow (New Helvetica Narrow equivalent), Zapf Calligraphic (Palatino equivalent), ITC Zapf Chancery, and ITC Zapf Dingbats. Additional fonts are available through the use of Qume downloadable soft fonts.

The Publisher is compatible with Macintosh (512K of RAM minimum) and Apple IIgs computers through the printer's standard AppleTalk interface, and can also be linked to MSDOS and OS/2 systems via the standard serial or Centronics parallel interfaces. Using the Apple LocalTalk PC card, any combination of up to 31 Macintosh, Apple IIgs, MSDOS and OS/2 users can be networked to the same printer.

The drum and toner for the printer are separated units. The drum, an Organic Photo Conductor (OPC) drum, is rated at 10,000 pages while the toner unit has a 6,000 page lifecycle.

Letter, legal, DIN A4 and DIN B5 paper sizes of transparency overhead film can be used with the Publisher. The paper cassette holds 100 sheets with the output face-down and collated.

The CrystalPrint Publisher has a suggested retail price of $4,499, and replacement drum and toner sets retail for $129 and $99, respectively. The printer will be sold to Value-Added Resellers (VARs) and dealers through Qume's nationwide distributor network and direct sales force. Evaluation units are available in 45 days with production units scheduled for shipping in October. A one-year warranty comes with the Publisher with service provided by Momentum Service Corporation.

Additional information is available from Qume Corporation, 500 Yosemite Drive, Milpitas, CA 95035; 408-942-4000; telex: 910-338-0232; FAX: 408-9420-4052. ●

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Dinosaur Days Adds A New Twist To The Pelican Writing Series

Learning Lab and Pelican Software announced the release of the newest title in their Creative Writing Series, Dinosaur Days. While it can share graphics and files with the other programs in the series, this newest addition adds several new twists.

In addition to the full screen text processor, and graphics program, that allows the user to create illustrated books, puppets, comic books and more, Dinosaur Days includes a second Graphic Database disk that allows the student to explore the prehistoric world in ways they've never dreamed of.

Much like browsing through a HyperCard stack, using a mouse or the arrow and return keys, users can click on objects they see in a picture and a text window will appear with information. They can explore to their hearts content or print out the information for later reference.

An ideal tool for the classroom teacher doing a unit on dinosaurs or trying to encourage creative writing. Children at home will delight to the hundreds of fanciful and realistic graphics available to them to create their own prehistoric worlds, and print them out in five unique sizes. In addition, because it is compatible with the other programs in the Creative Writing Series including Monsters and Make Believe and Creation, the worlds they can create are limitless.

Dinosaur Days is available now for Apple II family 64K+ and IBM is scheduled for release in Fall 1988. The retail price is $39.95. Lab Packs are available for schools.

For more information contact Learning Lab Software Publishing, 8833 Reseda Blvd., Northridge, CA 91324; 1-800-247-4641 National, 1-800-222-7026 California. ●

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Interlude II is the most sensational computer program on the market. Each time you play, the program starts with a computerized interview to probe your deepest desires and fantasies. Then it suggests a romantic or sexual scenario to match your mood of the moment. Over 160 Interludes are contained in the program including Love Odyssey, Light My Fire, From Here to Ecstasy, Thriller, The Pleasure Tapes, Madam's Menu and Rembrandt's Delight. According to US Magazine: "the most edifying third party to join couples between the sheets since the "Joy of Sex". Forum: "... personalized suggestions for enhancing any sexual relationship..." Better than watching the PLAYBOY CHANNEL. Available for IBM, Apple and compatibles. IBM 3 1/2 format now available. Order from Dolphin Computers.
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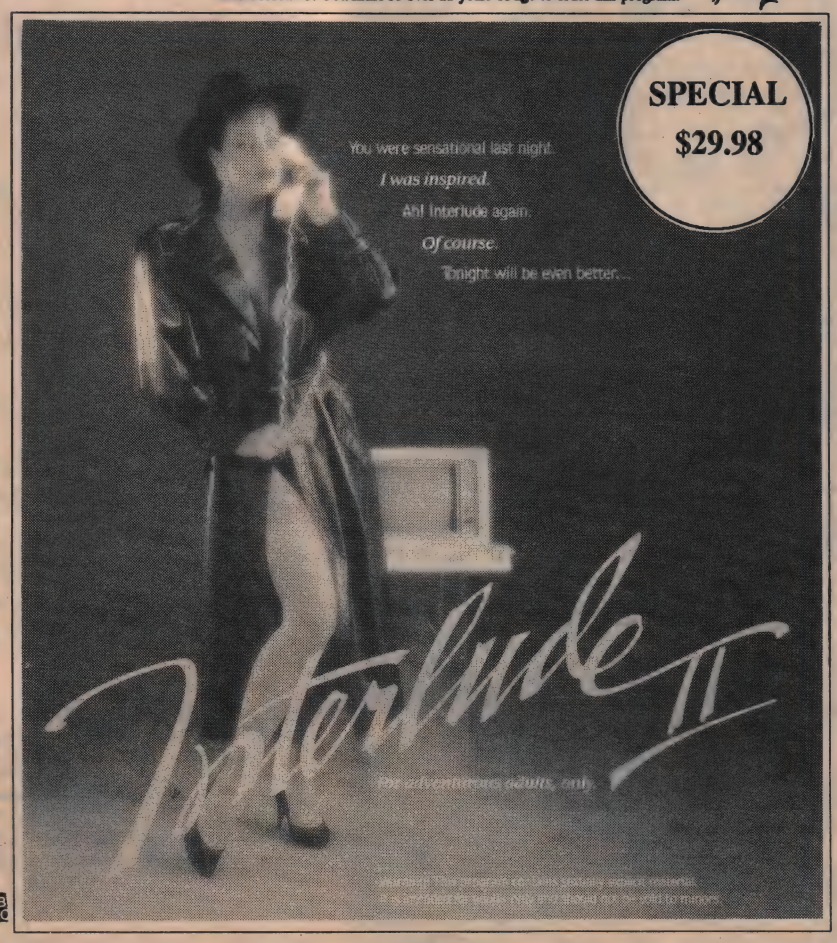

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Terrapin's Logo Plus Gives Users Many New Features

This new version of Logo contains over 40 additional commands which gives users more power and flexibility. Logo PLUS contains simple commands to add text to the graphics screen in various colors, fonts and styles (including bold, underlined, italicized and inverse letters). An easy-to-use shape editor lets users create a variety of shapes for the Logo "turtle" and stamp them on the screen. Plus, any region of the screen can be painted with a color using the FILL command. In addition, pictures can now be printed to the ImageWriter printer with a single command. Students can create maps, animated stories, improved adventure games, detailed charts and graphs, and more complex and realistic pictures.

Logo PLUS is based in ProDOS rather than DOS 3.3, and has been designed so that most people will never notice the difference in operating systems. Experienced users have access to all the file-handling features of ProDOS. And, current Terrapin Logo users can convert their files from DOS 3.3 to ProDOS and run them with Logo PLUS.

Logo PLUS runs on Apple computers with 128K of memory. The package comes complete with a Language disk, Utilities disk, "Getting Acquainted with Logo PLUS" booklet, Logo Project Card, Quick Reference Card, and comprehensive documentation. The single package ($119.95) comes with both a 3.5" and 5.25" disk. Logo PLUS is also available as a 5-pak ($199.95), a 10-pak ($299.95), a 20-pak ($399.95) and a site license ($399.00). Terrapin Logo for the Apple can also be exchanged for Logo PLUS, contact Terrapin for details.

Terrapin is making an introductory offer of $99.95 for the single package of Logo PLUS. Orders must be placed before October 31, 1988 to receive this discount. Special site license and upgrade fees will also be available.

For more information contact Terrapin, Inc., 376 Washington Street, Malden, MA 02148; (617) 322-4800. ●

Sky Travel
continued from page 258

page-size outputs (Diagram #2) of the section of the sky you've chosen. With the save command you're given a standard file name menu and you can choose different drives or folders for your chart. The quit command sends you to minifinder if you've booted from the distribution diskette. Besides the Save MacPaint function you can also create screen photos with all of the menus with the standard Command-SHIFT-3 command.

The Edit menu is only included for compatibility with desk accessories which need it, and Sky Travel ignores this menu.

The Options menu lets you choose a variety of options. You can choose the world map to select a different location, get information on an object, center your screen view on the object you've chosen, track a location in the sky, or an object, and choose a variety of toggle options. You can turn on and off the: Constellation lines, Constellation Names, Planet Symbols, Ecliptic Symbols (shows the ecliptic and the zodiac symbols), Deep Sky objects (galaxie, clusters, and other objects not visible with the naked eye), Celestial Globe Lines (lines or Right Ascension and Declination), Chart Orientation (inverse mode as the sky would look on a chart), and Horizon (shaded areas below your viewing position). The options menu also lets you set the Fast Slewing mode which increases the speed of the program by "cutting corners" with ignoring minor stars and the Chart lines.

The View menu lets you select your telescope's "zoom" factor, and move quickly in the ordinal directions. You can select zoom levels from 72 degrees (wide) to 4.5 (tele) and several in between values. I would have liked more values beyond what's available though. Even at the widest field (72 degrees) you can't see more than a small portion of the sky, and the greatest magnification (4.5 degrees) isn't close enough to examine close occulations. The View menu also lets you quickly move your view to: north, south, east, west, and opposite directions from your view.

The Find menu lets you find any major object quickly. You can search for the Sun, Moon, Halley's comet, planets, or any constellation. One unusual limitation, Halley's comet can only be calculated for Sept 3, 1985 through July 31, 1986. This was Halley's last pass when it was visible, but Halley is always there—it just isn't always visible. In ad-

continued on page 408

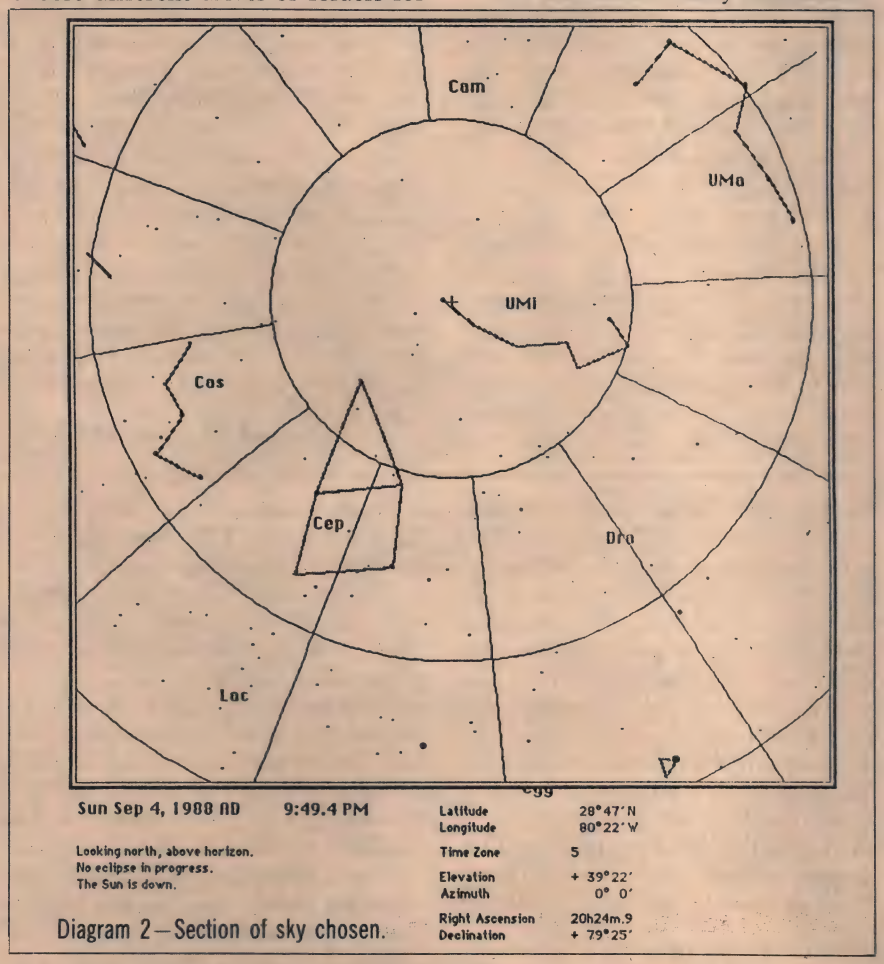

Diagram 2—Section of sky chosen.

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Sky Travel
continued from page 407

dition, Halley makes regular passes through the inner solar system on a 75-76 year cycle, and there have been several earlier visits most notably for the birth—and death of Mark Twain on its last two trips.

The Clock menu lets you adjust the speed of the Sky Travel Clock. You can command the program to change its time to the current time in your Mac's clock, you can reverse the clock to show events in reverse, you can freeze the time, operate at normal speed, or at several fast modes up to 64 times real time speed. It's also possible to quickly move a week forward or reverse in time. Two other functions on this menu let you choose 12 or 24 hour time modes, and display GMT or your local time.

Sky Travel includes the primary planets in this solar system, the Sun, Moon, Halley's comet (within the period mentioned), and all major stars and constellations visible with the naked eye. You can also toggle on and off deep space objects like galaxies, global clusters, and other inter-galactic items of interest. Ironically the program doesn't include several much closer items of interest which you can observe with an inexpensive pair of binoculars including Jupiter's moons and the larger asteroids. Hopefully this will be corrected in a later release.

The best part of Sky Travel has to be its 76 page manual. Only 22 pages of instructions are dedicated to how to use the program. 8 pages include a glossary with a list of suggested books to read and a bibliography, five pages include tables for the latitude and longitude of many U.S. and international cities, locations of navigational stars, special events (solar eclipses, transits of Venus and Mars), and conversion tables. The other 41 pages of the manual are dedicated to showing you astronomical observations, and beginner's information on astronomical observations.

Many historical events where astronomy took place, or astronomy has been used to determine exactly when the event took place are illustrated. Was the Star of Bethlehem actually a conjunction of two planets? How can ancient solar and lunar eclipses be used to accurately date events in history? Were the shafts in the Great Pyramid at Giza used so a buried king could pass directly into the heavens? Did an ancient sculptor etch a stone lion on top of Mt. Nimrod to commemorate the victory of an important battle? How can the location of the Pole star be used to calculate your latitude and longitude?

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MacUniverse
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Olympic coverage). Otmar Foelsche from Dartmouth College displayed a laser disk that was developed at Dartmouth to aid students in using their Macintoshs in conjunction with the vast computer information banks maintained by the college. Reese Cohen of the Berkeley Macintosh Users Group ("BMUG") showed how HyperCard controlled the accessing of over 3,000,000 characters of public domain (free) software on the club's CD-ROM library. Kirk Scott, an independent designer and HyperCard developer, provided a connecting thread for the discussion by describing some of the design guidelines that he had been working on with Apple Computer. One of the most striking things about this session was that it was attended by approximately 800 persons—people who would then have to travel to the other locations for the product demonstrations. This type of interest seems to us to reflect the great penetration that HyperCard has made in a very short time, an interest that will be heightened even more as more HyperCard applications using CD-ROM, laser disks and videotape technology appear.

The number of new or revised HyperCard related books on display at MacWorld gave further evidence of the HyperCard explosion. Danny Goodman, author of the original "bible," *The Complete HyperCard Handbook*, now has *Danny Goodman's HyperCard Developer's Guide* (also from Bantam, $29.95) and will update the original book to cover new releases; Addison-Wesley Publishing Company announced *Apple HyperCard Script Language Guide: The HyperTalk Language* ($22.95), a work written and produced by Apple Computer personnel; Brady showed *Applied HyperCard—Developing and Marketing Superior Stackware* ($39.95—disk included) by Jerry Daniels and Mary Jane Mara; Hayden releases a revised version of Dan Winkler's *HyperTalk Programming* ($24.95); Que weighed in with *HyperCard QuickStart* ($21.95) by Richard Maran and Sybex, Microsoft Press and Compute all have "Quick-Reference" books ($10.95, $5.95 & $12.95 respectively) to supplement the "how-to" books mentioned. One of HyperCard's accomplishments apparently has been the causing of a resurgence of the computer publishing industry.

The HyperCard euphoria was no more evident than at the "HyperCard Birthday Party" that was thrown by Apple on Friday evening, August 12th for 1500 of HyperCard's close friends. With Bill Atkinson and most of his "HyperCard Team" on hand to accept congratulations, jugglers, stilt-walkers and a variety of bands provided a birthday party atmosphere.

And Many Other Things

There were of course, many other attractions at MacWorld—new versions of existing products, Macs controlling embroidery, new color printers, brand new high-level mathematics & science software (an area only slightly supported until the present), new publications, mainframe & minicomputer connectivity products, etc.—we'll explore more of these topics in subsequent columns. ●

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Sky Travel
continued from page 408

All of these examples are given along with descriptions on how you can use the Sky Travel program to simulate these events.

There are two examples listed on the back cover which aren't mentioned in the manual though: Galileo discovering Neptune, Southwest Indians looking at Carb Nebula in 1054 AD.

It's quite likely that Galileo accidentally discovered the planet Neptune while examining Jupiter's moons. His notebooks describe an observation of a "star" which was probably Neptune. Since even the possibility that there might be undiscovered planets was unheard of, Galileo just thought that it was another star, and he recorded it as a star in his notebooks.

To see what Galileo saw set the location to Northern Italy (44 degrees North, 11 degrees East—Time zone-2) at 11 pm on January 28, 1613. Search for Jupiter and turn on the planet indicators. Your screen will show the symbols for Jupiter and Neptune on top of each other showing that Galileo probably accidentally discovered Neptune without realizing it. The problem is that Galileo reported Neptune in a different location than where current formulas would put it, indicating that a large planet beyond Neptune's orbit probably exists which hasn't been discovered even today. A full description of Galileo's observations was published in the December 1980 issue of *Scientific American* titled "Galileo's Sightings of Neptune" by Drake and Kowal.

What we now refer to as the Crab Nebula was the most exciting night time event for the year 1054 AD. A star exploded and the explosion reached the Earth that year. The problem is that there's no record of the explosion in Western Europe, or any areas of Christian influence. We have records describing the explosion from Arabic, Asian, and the American Indians, both in folklore and detailed observations—but no record whatsoever from Western European sources. The Church held the views that the heavens were unchangeable and suppressed all writings or descriptions of the event—even though the Supernova made night as bright as day for several weeks! There's no doubt that the event happened, even today we can look in the sky and observe the Crab Nebula, the results of that explosion. The Crab Nebula now serves as a reminder in the sky about what can happen when an all powerful body decides to use disinformation and force to ignore the facts, or what happens when the Church decides that its beliefs are more important than the facts.

Sky Travel is an excellent observation tool for classrooms as well as for professional astronomers. You don't have to worry about waiting for night time or for interference from clouds, streetlights, pollution, or other atmospheric conditions which will interfere with your observations. The database and text information sections are all excellent sources of information. Some of the controls are a little delicate though and it takes time to get used to their "feel." For example if you are using the fine set mode for the location indicator and your mouse slips you may suddenly find out that you're viewing the sky from Antarctica! Another important feature missing is the lack of method to search for an object by its celestial coordinates. You can easily search for the sun, moon, planets, and major constellations, but you can't search for an object by its Right Ascension and Declination, or Azimuth and elevation. I would have liked the program much better if that option would be added to the Find menu.

As an educational tool Sky Travel is an excellent program. As a useful professional tool Sky Travel can perform calculations and produce outputs much faster than conventional methods. It's an excellent guide to the universe if you're interested in astronomy.

Product: Sky Tavel

Authors: Dr. Fred Ancker, Dr. Frank Covitz, Dr. Clif Ashcraft, Robert McNally, Walter Hochbruckner, Paul Kriss and Keith Sproul.

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Summary: Excellent astronomy tool for the amateur or professional astronomer, or for education. ●

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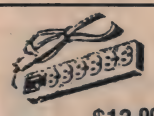

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cellent gray selections; easier baud rate and handshaking set commands; simpler choice of the number of copies and job length; a persistent down-loading; instant listing of currently resident fonts to host or page; a sublime sneaky secret snooper that activates superexec; a few repeatable timers and stopwatches; a quite easy random

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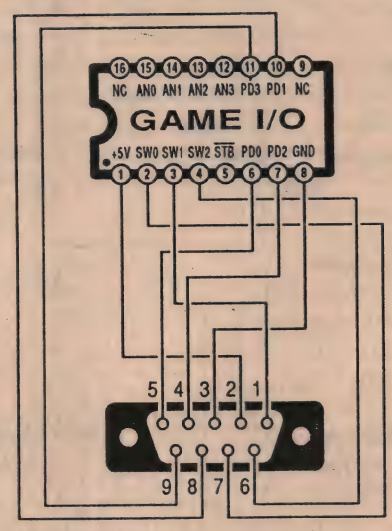

shown as female DIP socket on motherboard

shown as female DB-9 socket on rear panel

Use a **female** 24 pin DIP socket and a **male** DB-9 plug to adapt an **old** game paddle or joystick to the rear panel connector.

Use a **male** 24 pin DIP plug and a **female** DB-9 plug to adapt a **new** game paddle or joystick to the internal motherboard socket.

Fig. 3 – Two old/new game paddle adapters.

acos	Trig arccosine. call with **xside hypotenuse acos**. See also **asin**.
asin	Trig arcsine. call with **yside hypotenuse acos**. See also **acos**.
backwards	Print backwards from right to left. For transparent window decals.
baud.57600.x.25	Set the baud rate to 57600 baud, XON/XOFF handshaking, on the DB25 connector. The others are similar. This is device dependent.
bestgray	A 106 line, 45 degree screen. A good general, all purpose fine gray.
black	Switch to black. Same as **0 setgray**.
blackflash	Eject totally black page. Use twice for highest possible print quality.
copies	Select the number of copies, as in **6 copies**.
dobaud	A service routine used by **baud.57600.x.25** and company.
feetfirst	Eject the page rightside up or feet first.
inch	Change size to inches, as in **3 inch** for a 3 inch line.
indiagray	A very fine 133 line, 25 degree gray with 6 gray levels. Requires care.
landscape	Switch to landscape mode, printing wider than high.
lightgray	Select the lightest available gray.
listfonts	Send a list of all resident fonts back to the host.
longjob	Lengthen the wait timeout to 3 minutes. Gives the host extra disk time.
manual	Select manual, rather than tray feed. For thick or oddball paper stock.
negative	Print white as black and black as white. Useful for reversals.
notestpage	Cancel the test page that is printed on startup.
outline	Find the outline path of the current character.
persist	Do a persistent download of the code that follows.
pi	The math constant 3.1415926.
pixel	Scale to 300 DPI pixels, rather than points.
positive	Restore normal printing after using **negative**.
printfonts	Print a list of all resident fonts onto the page.
putridgray	Restore the default 53 DPI, 45 degree gray screen.
random	Generate a random number. **6 random** returns 0-5.
report	Return top of stack to host and stall briefly.
reprogray	A good 85 DPI, 35 degree gray for reduced prepress output.
resettimer	Initialize multiple time interval measurement. See **starttimer**, **stoptimer**, and **reporttimer**. Use **stopwatchon** and **stopwatchoff** for single shots. For instance, two time intervals would be measured by **resettimer**, **starttimer**, {do something} **stoptimer**, {spin wheels} **starttimer** {do something} **stoptimer reporttimer**.
reporttimer	Return measured time to host. See **resettimer**.
snoop	Activate **superexec**. A **{forall} superexec** overrides **readonly**.
stall	Time delay, as in **1500 stall**. Gives host time to respond or record.
starttimer	Begin part of multiple time measurement. See **resettimer**.
stoptimer	End part of multiple time measurement. See **resettimer**.
stopwatchoff	End single time measurement and report to host. See **resettimer**.
stopwatchon	Reset and begin single time measurement. See **resettimer**.
tan	Trig tangent. Use **yside xside tan**. Inaccurate very close to 90 degrees.
tray	Return to normal tray feed.
white	Switch to white. Same as **1 setgray**.
width	A **(string) width** finds only the x width of the string.
yestestpage	Restore the test page that is printed on startup.

Fig. 4 – Some new PostScript nuisance commands.

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number generator; and a one word stopping of the test page.

Some of these new commands are specific to the LaserWriter, while a few others are intended primarily for 300 DPI printing. All the rest can be used pretty near anywhere.

The blackflash command ejects a totally black page. For the highest possible print quality, you eject two fully black pages before you do print your final copy. This gives you some excellent black fills and light grays that are all highly uniform.

Speaking of which, there are now four commands to pick useful grays, instead of the seventeenth lousiest one that most PostScript applications seem to have their heart set on. The bestgray is the all around best choice here; a denser indiagray is available but requires care in use, along with a reprogray that is ideal for reduced prepress. If you ever want to return to the default gray, just use the new putridgray command.

There are now six different timer commands, depending on what you want to do. If you are only interested

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```
% Copyright c 1988 by Don Lancaster and Synergetics, Box 809, Thatcher, AZ 85552.
% (602) 428-4073. All rights reserved. Personal, non-commercial use permitted so long as
% this header remains present and intact. Latest disk costs $24.50.

% nuisancedict is persistently downloaded as a dictionary. Activate with nuisance begin

0 exitserver serverdict begin 200 dict /nuisance exch def nuisance begin. 1000 dict /nuisance
exch def nuisance begin

/acos {2 copy dup mul exch dup mul sub sqrt exch pop exch atan} def % xside hypot acos

/asin {2 copy dup mul exch dup mul sub sqrt exch pop atan} def % yside hypot asin

/backwards { 612 0 translate -1 1 scale} % print backwards

/baud.1200.d.25 {1200 25 4 dobaud} def /baud.1200.x.25 {1200 25 0 dobaud} def
/baud.9600.d.25 {9600 25 4 dobaud} def /baud.9600.x.25 {9600 25 0 dobaud} def
/baud.19200.d.25 {19200 25 4 dobaud} def /baud.19200.x.25 {19200 25 0 dobaud} def
/baud.38400.d.25 {38400 25 4 dobaud} def /baud.38400.x.25 {38400 25 0 dobaud} def
/baud.57600.d.25 {57600 25 4 dobaud} def /baud.57600.x.25 {57600 25 0 dobaud} def

/bestgray {106 45 {dup mul exch dup mul add 1.0 exch sub} setscreen} def % 106 line

/black {0 setgray} def

/blackflash {0 0 moveto 1000 0 rlineto 0 1000 rlineto -1000 0 rlineto closepath fill showpage }
def % black pre-page for highest print quality

/copies { /#copies exch def} def % as in 6 copies

/dobaud {serverdict begin 0 exitserver statusdict begin 3 copy setsccbatch setsccinteractive
end quit} def % used by baud commands

/feetfirst {180 rotate 612 792 translate} def % eject print feet first

/inch {72 mul} def % inches

/indiagray {135 35 {dup mul exch dup mul add 1.0 exch sub} setscreen} def %133 screen

/landscape {-90 rotate -792 0 translate} def % pick landscape printing

/lightgray {0.99 setgray} def

/listfonts {FontDirectory {pop == flush 200 {37 sin pop} repeat } forall} def % fonts to host

/longjob {statusdict waittimeout 180 put} def % lengthen job timeout

/manual {statusdict /manualfeed true put} def % start manual feed

/negative {{1 sub abs} settransfer} def % negative printing

/notestpage {serverdict begin 0 exitserver statusdict begin false setdostartpage end end quit}
def % cancel test page

/outline {false charpath} def % finds character outline path

/persist {serverdict begin 0 exitserver} def % starts persistent download

/pi 3.1415926 def % you wanted rhubarb instead?

/pixel {72 mul 300 div} def % 300 dpi only

/positive {{ } settransfer} def % restore positive printing

/printfonts {/Helvetica findfont [10 0 0 10 0 0] makefont setfont /xpos 150 def /ypos 600 def
/yinc 12 def xpos 20 sub ypos 20 add moveto (CURRENTLY INSTALLED FONTS:) show
FontDirectory {pop 100 string cvs xpos ypos moveto (/) show show /ypos ypos 12 sub def}
forall showpage} def % fonts to page

/putridgray {53 45 {dup mul exch dup mul add 1.0 exch sub} setscreen} def % stock screen

/random {rand 65536 div 32768 div mul cvi} def % as in 6 random for 0-5 result

/report {== flush 100 {37 sin pop} repeat } def % top of stack to host

/reprogray {85 35 {dup mul exch dup mul add 1.0 exch sub} setscreen} def % 85 line

/reportimer {mytime 1000 div (\rElapsed time: ) print 20 string cvs print ( seconds.\r) print flush}
def % to host

/resettimer {/mytime 0 def} def % reset timer

/snoop {1183615869 internaldict begin} def % activates superexec

/stall {{37 sin pop} repeat} def % delay as in 1500 stall

/starttimer {usertime /mytimenow exch def} % add to time so far

/stoptimer {usertime mytimenow sub /mytime exch mytime add def} def % for multiple timing
intervals

/stopwatchoff {stoptimer reporttimer} def % for single shots

/stopwatchon {resettimer starttimer} def % for single shots

/tan {dup sin exch cos dup 0 eq {pop 0.000001} if div} def % tangent

/tray {statusdict /manualfeed false put} def % stop manual feed

/white {1 setgray} def

/width {stringwidth pop} def % finds x width of string

/yestestpage {serverdict begin 0 exitserver statusdict begin true setdostartpage end end quit}
def % restore test page

end
```

Fig. 5 – A PostScript nuisance dictionary.

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in making one single time measurement, you can use stopwatchon and stopwatchoff. If instead, you want to find out the accumulated time that gets spent inside certain PostScript procs, you start off with a resettimer. Then you do a starttimer every time you enter the proc, followed by a stoptimer on each exit. Finally, you report the time back to the host with a reporttimer command.

The snoop command will activate superexec for your use. For instance, if a forall gives you an invalidaccess error, a {forall} superexec often will not. The same trick will often work for {get} superexec.

Calling snoop also does open up internaldict along with all its many strange and wondrous denizens. Very handy. And most interesting.

A 6 random command will return to you a random number in the range of zero to five. Should you in fact really want a one to six result, just tack on a 1 add after calling random.

Two listers of resident fonts are provided. The listfonts command will return a list of all the currently resident PostScript fonts (internal, custom created, or downloaded) back to the host. The printfonts will instead print a list on paper for you.

The testpage can be defeated with notestpage and later restarted by activating my yestestpage command.

These several dozen brand new commands are my choice of what I presently think I would like for me. Obviously, you can easily and permanently rearrange the scenery to suit yourself.

So, why don't you? As yet another stupid contest this month, just show me how to improve upon any of the existing nuisance commands or add some new ones that others might find useful. Let's hear from you. ●

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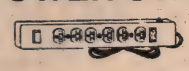

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Apple & DEC Consummate The Marriage

by Barbara E. McMullen
& John F. McMullen

This is a follow up on the joint commitment made by Apple Computer, Inc. & Digital Equipment Corp. (DEC) in January 1988 to integrate the Macintosh and VAX computer environments. The two firms hosted an Apple/Digital Developers Conference at Boston's Marriott Longwharf Hotel August 7th through 9th which concluded with a press conference hosted by Jean-Louis Gassee (at that time senior vice president, research, development and product marketing at Apple; now through Apple's reorganization, one of the presidents of Apple's four companies) and John Rose (Group Manager, Personal Computing Systems Group, Digital Equipment) at 6:00PM on the 9th.

The conference scheduled began slowly on Sunday evening with the sole items being the 7:00PM Dinner/ Keynote address by Randy Battat, Apple's vice president of product development but heated up dramatically on Monday with a full schedule that ran from 9:00AM to 5:00PM and included short talks by Apple's Jean-Louis Gassee, Rich Cates and Gursharan Sidhu, Technical Director, Network Systems Development and Digital's Kurt Friedrich, Bill Strecker and Jeff Schriesheim. The technical meat of the day were two panels Connectivity Framework Panel Discussion and Data Access/Resource Sharing Panel both hosted by Ron Wong, Apple's Networking and Communications Evangelist which featured presentations of bread & butter topics such as AppleTalk for VMS (Steve Wolfe, Apple)—an explanation of the system which implements the AppleTalk Protocol Architecture for VAXs so that a VAX may participate in an AppleTalk InterNet; AppleTalk for VMS is the foundation for connectivity of Apple/Digital Products, AppleTalk/DECnet Gateway (Phil Trasatti, Digital)—a description of the VAX based software which allows a link between AppleTalk and DECnet (the software and hardware communications products that allow the participation of DEC operating systems in a networked environment), Network Management (Howard Ridenour, Apple)—an examination of network control in a multi-vendor Macintosh/VAX system, File & Print Services (Alan Abrahams and Rick Krasin, Digital)—a detailed explanation of how the integrated network may best utilize the appropriate I/O devices shared in the system and CDA/DDIF (Bob Travis, Digital & Alan Poggio, Apple)—a discussion of how the integrated system may make use of Digitals Command Document Architecture and its Digital Document Interchange Format.

Tuesday's Program continued the Ron Wong led panels and dealt throughout the day with specific Apple and DEC product tools important to the developer of an integrated Macintosh/VAX system. One of the most important of these presentations was the one in which Jim Groff of Apple's NI unit described the CL/1 Connectivity Language (developed by Network Innovations Corporation before its recent acquisition by Apple). CL/1 produces SQL (Structured Query Language) commands for transmission to a DEC-resident database. It is based on ANSI SQL standards and directly links with Apple's HyperCard product and will also provide links to completely different environments (such as IBM's industry dominant DB2 database management system). Jim Steiner of Digital followed right up on the CL/1 presentation with a description of DEC's SQL based services in which he stressed the importance of a high performance DEC SQL product that allowed interaction with a wide variety of desktop terminals (such as Macintoshes, MSDOS systems, Ultrix and VAX workstations).

Other products dwelt on in Tuesday's sessions were Digitals VAX VTX and VAX VALU, DECWindows and Apple's MacWorkStation, Macintosh X-Windows and the Macintosh Communications Toolbox. DECWindows and Macintosh X-Windows represent Apple & Digitals support of the industry standard X-Window System Version 11

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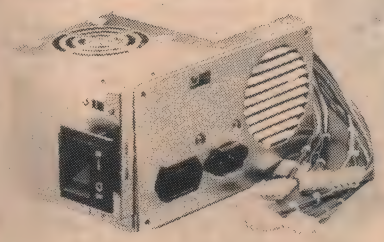

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Aldus Announces Desktop Presentation Software

Aldus Corporation recently announced Aldus Persuasion, a complete desktop presentation software program for the Apple Macintosh. Aldus acquired the marketing and development rights for Persuasion from an independent developer in February 1988.

Persuasion includes a complete set of tools for creating presentations in black and white color—including full-function outlining, word processing, drawing, charting, and layout. Presenters simply select one of the professionally designed AutoTemplate slide formats and type their ideas into the outliner. Persuasion automatically formats the outline text into slides or overheads ready to print. Any changes made to the outline automatically transfer to the slide, and vice versa. Users can also create their own AutoTemplates, customize existing templates, or work directly on the individual slides themselves.

Word processing functions include type specification, automatic word-wrap, multiple indent levels, tabs, variable line and paragraph spacing, search and replace, and a spelling checker. Presenters can also mix typefaces, styles, sizes, and colors within a text block.

Persuasion's drawing program contains tools for lines, rectangles, circles, polygons, arcs, and freeform sketching. Special effects options include rotation and graduated fills. Persuasion also accepts existing graphics files in the PICT, PICT2, and EPS formats from MacDraw and MacDraw II, Aldus FreeHand, and Adobe Illustrator.

For charting numbers, Persuasion automatically converts data into a wide choice of chart types: bar, pie, line, area, scatter, high-low, table, and user-defined formats. Data can be imported from spreadsheets, such as Microsoft Excel, or entered directly in Persuasion's special work area.

Persuasion also incorporates a number of convenient presentation management tools. The slide sorter allows presenters to view and rearrange presentations on screen for the most effective visual flow. Automatic slide overlays, or "build sequences," introduce points one at a time. And with Persuasion's slide-show feature, presenters can rehearse their delivery, set up a self-running version, or give the presentation to a small audience right on the Macintosh screen.

Persuasion also produces speaker notes and audience handouts, complete with thumbnails of the slides, to accompany the presentation.

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Apple & DEC

continued from page 413

(X11) developed at the Massachusetts Institute of Technology. DECnet will provide a distributed user interface to Apple's planned Macintosh X11 server which is to be configured as an X server fully compatible with the Multi-Finder Macintosh Operating System.

MacWorkStation is Apple's programming tool kit that allows host computer based applications to provide the standard Macintosh user interface to those Macintosh workstations tied into the system. The providing of pull-down menus, dialog boxes and multi-window control is accomplished through the use of MacWorkStation routines which the host application may call to create the Mac user interface.

At the concluding press conference, Gassee and Rose spoke glowingly of the accomplishments of the 328 participants in the Developers conference and committed the resources of their respective companies to ensure that the highest priorities are placed on enhancing systems supporting seamless Macintosh/VAX connectivity. Based on success to date in these areas, the firms expect end-user products and the new developer tool kits to begin to appear in the summer of 1989.

To support their stated commitment, Gassee & Rose announced the following:

1. AppleTalk for VMS, the basic development platform for integrating AppleTalk and DECnet/OSI networks, will be significantly enhanced to include wide-area routing capabilities via DECnet tunnelling and AppleTalk/DECnet gateway functionality.

2. A VAX-based AppleTalk Filing Protocol (AFP)—compliant file server will be included as part of Digital's Macintosh integration offering.

3. Print services will allow users from both environments to access PostScript printers on both AppleTalk and DECnet/OSI networks as well as print queuing and other services available on VAX VMS.

4. Network management functionality that allows for management from both AppleTalk and DECnet networks will be provided.

5. Terminal access and X-Windows support on the Macintosh to access VMS-based applications.

6. Apple and Digital announced specifications for client and server implementations that provide support for SQL and CL/1 database access.

7. Apple will support Digital's Document Interchange Format (DDIF) document content standards for document interchange between Macintosh and VMS systems.

Gassee, commenting on the announcements, stated The forward-looking architectures of AppleTalk and DECnet complement each other. The program and architectures announced today will give third parties the tools to develop a whole new generation of cooperative applications for the Macintosh and VAX environments.

The companies also announced that service for the Macintosh computers and products will now be available through Digital's Field Service organization in selected U.S. geographical locations. ●

Utility Software For Slide Water And ProColor

Matrix Instruments introduced an updated version of the Matrix Utility Software for its Macintosh compatible high-resolution film recorders at MacWorld.

The Matrix Utility Software allows users of Macintosh II computers to interface with the family of Matrix high resolution film recorders to create presentation slides. Using the Utility Software, the user can preview images as they would appear on 35mm slides, filling the slides area appropriately and substituting high resolution fonts for bitmapped fonts. They can add color to black and white patterns on PICT I files. PowerPoint users can save their presentation scrapbook using PICT format, and the Utility Software can then queue the entire scrapbook for batch imaging. Other software users can also image graphics individually or in a batch.

The new ProColor and the previously announced SlideWriter film recorders enable users of Apple Macintosh II personal computers to produce full color, high resolution 35mm presentation slides. Both film recorders are compatible with most major desktop presentation software, including MacDraw, PowerPoint, MORE, PixelPaint and SuperPaint. They both function as an integral part of a turnkey presentation graphics system. The ProColor also supports a 3x4 film option, convenient for quick preview prints.

Matrix Utility Software is bundled with both the ProColor and SlideWriter film recorders. The ProColor, in the Macintosh version, lists for $6495 and the SlideWriter lists for $11,795.

For additional information contact Matrix Instruments, Inc., One Ramland Road, Orangeburg, NY 10962; (914) 365-0190. ●

Desktop Presentation
continued from page 414

Additional features include access to 16.8 million colors on the Macintosh II, a 256-color palette, and the ability to specify color on the Macintosh Plus and SE. Users can customize their own color schemes, then print 35mm slides and overhead transparencies on color laser printers or film recorders.

Hardware And Software

Persuasion imports Acta and MORE outline files; text-only files from Microsoft Word, MacWrite, WriteNow, and other word processing programs; and WKS-formatted data from Microsoft Excel and other spreadsheets. It also accepts graphics files in the PICT, PICT2, and EPS formats from MacDraw, MacDraw II, Aldus FreeHand, Adobe Illustrator 88, and other graphics programs.

The software exports outline text to Acta and MORE in the text-only format and slides in the PICT and Scrapbook formats.

Persuasion is compatible with the Apple LaserWriter Plus, II NT, II NTX, and other PostScript-language printers; the LaserWriter II SC and other QuickDraw printers; QuickDraw film recorders; the Linotronic 100 and 300 and other Macintosh-compatible imagesetters; and compatible slide service bureaus.

The recommended system configuration for Persuasion is a Macintosh Plus, SE, or II, plus a hard disk and one 800K drive.

Packaging And Pricing

Aldus Persuasion is packaged with a comprehensive user manual, step-by-step tutorials, an illustrated guide to AutoTemplates, a quick reference guide, a collection of clip art images, presentation fonts, and color palettes in both slide and printed formats. The software also includes an on-line help program.

Persuasion will be available in the fourth quarter of 1988, at a retail price of $495.

For additional information contact Aldus Corp., 411 1st Ave. South Suite 200, Seattle, WA 98104; 206-628-6674. ●

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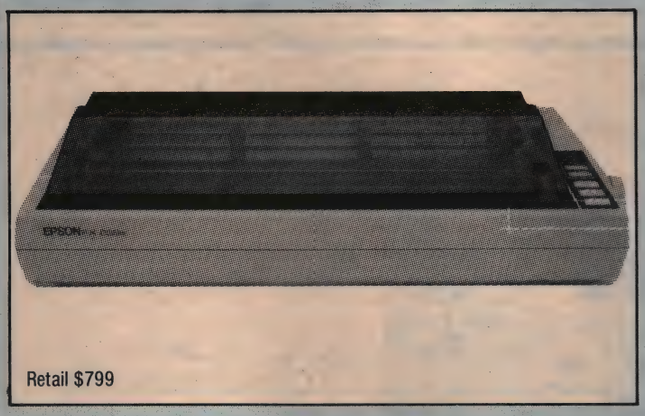

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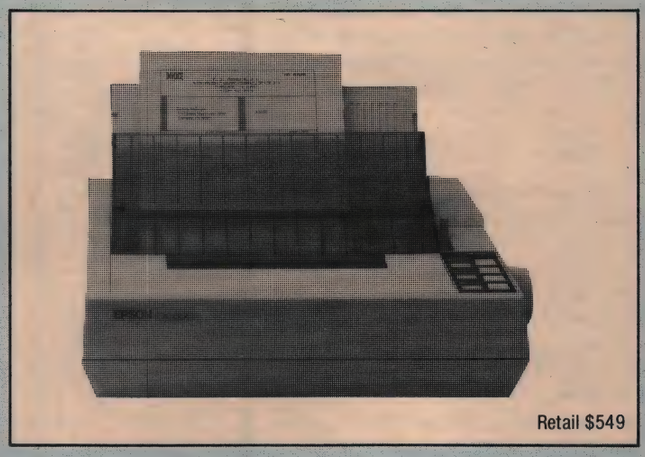

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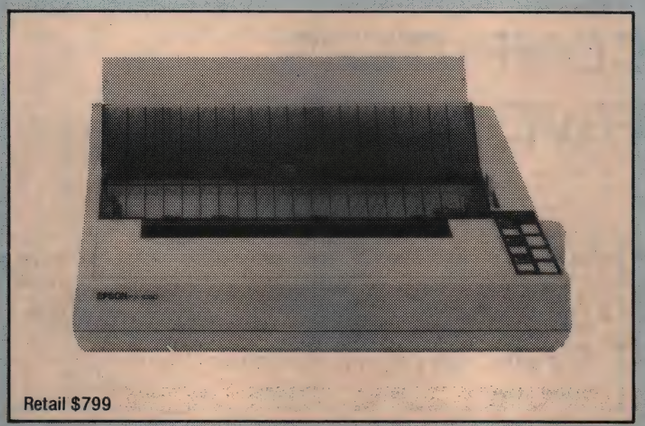

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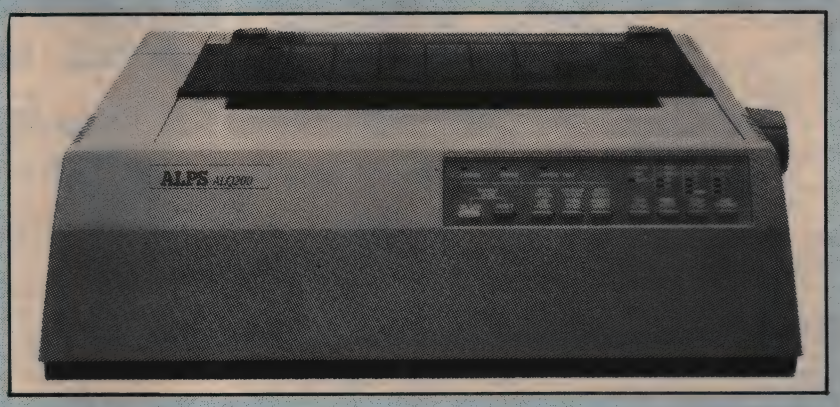

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Macintosh Version Of Wizard Of Words

Educational software publisher Advanced Ideas recently announced the availability of Wizard of Words for the Apple Macintosh. Developed in 1984 for the Apple II family, the IBM PC family and the Commodore 64, the program has been a consistent best-seller. The new version takes full advantage of Macintosh features, such as pull-down menus, improved sound, high-resolution graphics and mouse control.

Wizard of Words is an educational program which contains five word games, each of which reinforces a different language skill. Each game uses a 38,000-entry word list which is divided into eight difficulty levels. In addition, users can create their own word lists for use in two of the five games. This feature is especially useful for learning weekly spelling lists.

While the 38,000-word list includes those words most commonly found in the vocabularies of children ages seven to thirteen,the variety of games and the number of difficulty levels within each game keeps Wizard of Words challenging for ages five through adult.

Wizard of Words has earned the certification of endorsement of the National Education Association (NEA), as have all of Advanced Ideas' products. Wizard of Words has also been awarded the Family Computing Critic's Choice Award for outstanding vocabulary program.

Advanced Ideas has been a leading publisher of educational software since 1982 and is known for such programs as The Game Show and Dinosaurs, as well as Wizard of Words.

Wizard of Words retails for $39.95. All versions are available through computer specialty stores and retail chains.

For more information contact Advanced Ideas, 2902 San Pablo Avenue, Berkeley, CA 94702. Telephone (415) 526-9100. ●

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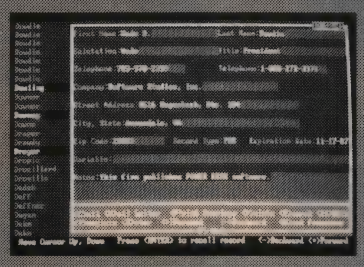

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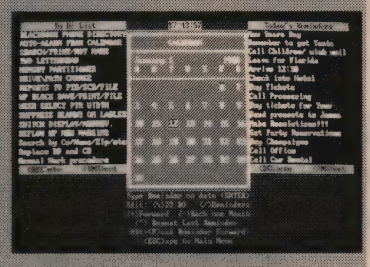

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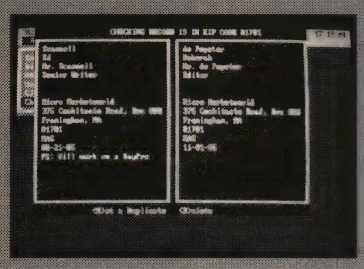

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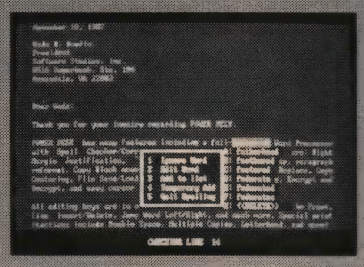

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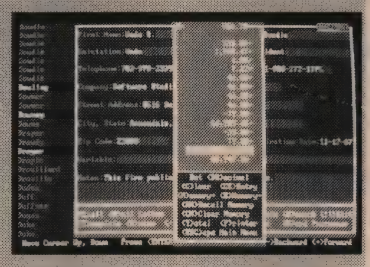

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Handy Keyboard Storage For Macs

A new, compact keyboard storage system for Macintosh computers has been introduced by Inland Data-Pak: the Inland MacDrawer.

The new Inland MacDrawer makes maximum use of space on narrow desks, tables or credenzas. It also elevates the Mac approximately 3¾" for a comfortable viewing height.

The MacDrawer features a smooth sliding keyboard drawer that rolls out from under the computer cabinet, and slides back when not in use for space efficiency and protection. The keyboard drawer has a built-in wrist support and stores Mac and Mac Plus keyboards and mouse units.

The support cabinet provides proper positioning of the Mac with four dimples that correspond to the computer's foot mark. An external disk drive or vertical hard disk drive fits comfortably on the cabinet next to the computer. The cabinet is complete with a keyboard cable port.

As an added precaution, the MacDrawer can be permanently fused to the work surface with pressure sensitive strips, or bolted down so it can't be carried away. The main unit and the keyboard can be secured to the Inland MacDrawer and work surface by using the Apple Macintosh security accessory kit.

The Inland MacDrawer is a perfect solution for schools and other institutions that required added protection for Macintosh computer systems. Dimensions for the external cabinet are: 16¾"Wx11"Dx3¾"H. The keyboard drawer measures 15¾"Wx8¾"Dx 3 1/16"H. Suggested retail price is $89.95.

For additional information, contact Inland Data-Pak, 32046 Edward, Madison Heights, Michigan 48071; (313) 583-7150. ●

New Macintosh Compatible Data Projection Panel

Dukane Corporation has announced a new LCD computer display panel compatible with the Macintosh, Mac+, Mac 512, and Mac SE—the MagniView 342, (Model 28A342).

Placed on top of any transmissive overhead projector, the MagniView 342 acts as an electronic transparency, allowing real-time monitor data to be projected onto any large screen. Designed to maximize audience attention and comfort, Dukane's new LCD projects text and graphics in crisp, vivid blue on a light blue background—the color combination most preferred by focus groups. During presentation, users can easily modify projected images by accessing the host computer's keyboard.

Dukane's MagniView 342, compact and lightweight, is ideal for use in educational and training programs, computer instruction and business presentations. The unit features an enhanced contrast ratio and a high resolution 512x342 pixel display, assuring consistently sharp, detailed projected images. A 4:3 aspect ratio, identical to that of computer monitors, affords distortion-free image reproduction—what you see on the monitor is exactly the same as what is projected on the big screen.

Engineered for reliable, trouble-free operation, Dukane's new LCD panel features "Chip-On-Glass" technology (computer chips embedded in the glass), making the unit safe from damage caused by transportation, vibration, etc. The unit's quiet, high efficiency fan, heat tolerant LCD and infrared filter ensure the cool operation required for a smooth, constant image, even when used on the hottest overhead projectors.

Dukane's easy-to-operate MagniView 342 has convenient top-mounted panel controls including Contrast, allowing the adjustment of image intensity to compliment lighting conditions; Reverse, permitting the reversal of display and background colors; Vertical Positioning; used to center the projected image (software packages vary); Sync, allowing stabilization of the projected image to match a specific computer; and Power, for turning off the presentation without turning off the monitor. A durable glass plate protects the MagniView's LCD, allowing users the convenience of writing directly on the panel with a water soluable transparency pen, without fear of damage.

Dukane's complete Macintosh compatible projection package, with a full one year warranty, consists of the portable 3.5 lb. LCD panel with non-slip feet, a 6' composite video cable, a board to adapt the host computer for panel use, and a UL approved transformer.

For additional information contact Dukane Corporation, 2900 Dukane Dr., St. Charles, IL 60174; (312) 584-2300. ●

Moniterm 19" 72 DPI High Resolution Display System

Moniterm Corporation has announced the Viking 1 72 DPI large screen (19 inch) high resolution monitor, which will be demonstrated at the Apple Computer booth #1158 and in Moniterm booth #2150 during Siggraph '88.

The Viking 1 72 DPI, compatible with the Apple Macintosh SE and Macintosh II personal computers, joins the Moniterm line of display systems for Apple Macintosh and MSDOS personal computers. The new Viking 1 72 DPI is a 72 Dot Per Inch "match quality" for desktop publishing and other applications relying on highly readable text, graphics and fast updating. The 72 DPI resolution retains text/graphic sizes which many Macintosh applications (i.e. word processing, page layout, etc.) were written to display.

Resolution is 1024x768 (square) pixels on a flicker-free, paper white screen. The non-interlaced monitor can display two full facing pages at one time. The easy to connect Viking is plug compatible with the Macintosh SE and other personal computers. The Viking 1 with controller card has a suggested retail price of $1995 and is now available. For additional information contact Steven Peer, Moniterm Corporation; (612) 934-4151. ●

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Intelligent Graphics Tablets For The Macintosh

Kurta Corporation introduced the first intelligent graphics tablets for Apple Macintosh II and SE computers. Called IS/ADB input systems, the three new programmable tablets enable Macintosh users to move screen cursors and to draw, sketch, and trace far more accurately than they could with a mouse. They also substantially reduce keyboard input and save user time by executing user-programmed command sequences.

Kurta's new IS/ADBs are now available in three sizes: 8.5x11 inches, 12x12 inches, and 12x17 inches. One of the biggest benefits of the tablets is absolute positioning: every point on a tablet corresponds exactly to a point on the screen. Users need merely place a Kurta pen or cursor on the appropriate tablet spot to indicate the matching screen position. This pointing method is excellent for tracing or digitizing—even with blueprints or other documents as much as one-half-inch thick placed on the tablet surface.

Mice, on the other hand, offer no absolute positioning. They must actually be pushed across their pads to move the on-screen cursor from one point to another, with no screen-to-pad correspondence.

The 8.5x11-inch IS/ADB is a low-cost mouse alternative for Macintosh users who need to trace, draw, or sketch. As Macintosh owners begin to select larger monitors and precision computer-aided design (CAD), mapping, and desktop publishing applications, their needs change. Kurta is the first to announce a choice of units with larger surface area for even more control and accuracy.

Along the top of an IS/ADB tablet is a row of up to 23 programmable function keys positions, each of which may be programmed with frequently used software command strings such as "align, save, and print" or "scale, position, shade, and plot."

The three IS/ADB input systems work on the Macintosh II and SE models by plugging directly into the Apple Desktop Bus. They draw their power and communicate on the same single cable, thereby requiring no wall power supply and causing minimal cable clutter.

Kurta's ADB design leaves the serial ports free for printers, plotters, modems, and local area networks such as AppleTalk, AppleShare, and others.

In addition to their programmable function keys, the IS/ADB systems also feature five "scale keys" which enable users to instantly scale their tablets for greater efficiency on different applications. The keys include "Std," by which the tablet scales itself to the Apple-defined active screen; "Zip," which is used in text mode to give the cursor the quick action of a mouse in a user-defined, conveniently small area of the tablet; "Set," which allows users to customize the tablet area to whatever size they find most comfortable; "Win," which dynamically scales the tablet to whatever window is active; and "Mon," which allows the user to rescale based on the monitor that is selected in a dual monitor environment. The control keys work independently or in combination with each other to create the most productive environment. No other graphics tablets offer such scaling functions.

The Kurta IS/ADB input systems will be available through Kurta dealers. Suggested retail prices are $395 for the 8.5x11, $595 for the 12x12, and $965 for the 12x17.

All systems come with a corded pen, interface software, and documentation. Kurta also offers IS/ADB-compatible cordless pens and corded or cordless 4-button cursors, whose buttons may be programmed to execute command sequences just as function keys are programmed.

For $50, Kurta will upgrade its earlier, non-programmable IS/ADB 8.5x11-inch Macintosh models. The upgrade includes the function key addition, current documentation, and current interface software. Users should call the Kurta technical support number at (602) 276-5533 for an authorization number and shipping instructions.

Kurta will also upgrade, at no charge, non-programmable IS/ADB 8.5x11-inch models purchased in August and September. The free upgrade offer is valid until January 1, 1989 with proof of purchase.

All Kurta IS/ADB units carry the only lifetime warranty in the graphics tablet industry.

For additional information contact Kurta Corporation 4610 S. 35th St., Phoenix, AZ 85040; (602) 276-5533. ●

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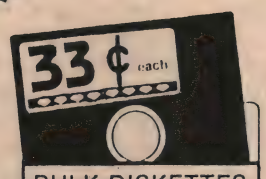

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(2) ☐ **PC-WRITE** v2.71 #W552A-B Complete word processor with spellcheck.

(2) ☐ **NY WORD** v2.2 #556A-B Wordstar clone with many unique twists.

☐ **GALAXY** v2.2 #W559 Fast, ram-based wp with pull-down menus.

(5) ☐ **BLACK MAGIC** v1.20 #W560A-B-C-D-E Outstanding hypertext wp.

☐ **EZ FORMS** #601 Great form-generating program.

☐ **LQ** v2.30 #W609 Near-typeset print on a dot-matrix printer.

☐ **PC-STYLIST** v1.2 #W611 Analyzes text files for readibility.

☐ **SPELLCHECK** v2.1 #W615

☐ **PC-OUTLINE** v3.34 #W653

UTILITIES

☐ **FASTCOPY** v2.0 #U703 Makes fast copies using both drives.

☐ **PROFESSIONAL MASTER KEY** v2.0 #U722 Disk management utility.

☐ **HD MENU** v1.3 #U725 Create a menu system for your hard disk.

☐ **LIST** v6.2 #U726 Display text files, search and print.

☐ **ADJRAM** v3.0 #U728 Adjust your ramdrive without re-booting.

☐ **SIDEWRITER** v2.0 #U737 Prints spreadsheets and text sideways.

☐ **COLOR GRAPHICS EMULATOR** v2.01 #U750 Turns an HGA into a CGA.

☐ **TEST DRIVE** v1.0 #U761 Test the alignment of your disk drives.

☐ **BAKER'S DOZEN** v1.0 #U763 A fine set of the most used utilities.

☐ **FLASHBACK** v1.56 #U766 Excellent hard disk backup and restore.

☐ **HUNTER** #U773 Search your hard drive by file name or content.

☐ **CHECKUP** #U776 Protects against viruses and trojan horses.

MISCELLANEOUS

(2) ☐ **GENEALOGY ON DISPLAY** v5.0 #A1002A-B

☐ **THE DIET DISK** #A1006 Contains numerous weight loss tips.

☐ **COUPON ORGANIZER** v1.4 #A1007

☐ **LOTTO BUSTER** #A1008 Assists in picking likely winners.

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☐ **HOME INVENTORY** v2.0 #A1039

☐ **DISKETTE LABELING SYSTEM** v5.25 #A1050 Create disk jackets.

COMMUNICATIONS

(4) ☐ **RBBS-PC** v16.1a #C1107A-B-C-D Sophisticated BBS system.

(2) ☐ **PROCOMM** v2.42 #C1115A-B Popular, communications program.

(2) ☐ **WILDCAT BBS** #C1118A-B Superb BBS system with many unique traits.

(2) ☐ **BOYAN** vd.3 #C1121A-B Easy-to-use communications package.

EDUCATIONAL

☐ **FAS-TYPE** v3.01 #E1203 Touch-typing instructional program.

☐ **THE WORD WORKER** v1.00A #E1214 A-B Search NT for words and verses.

(2) ☐ **NUTRITIONIST** #E1236A-B Ultimate nutritional analysis system.

☐ **AMY'S FIRST PRIMER** #E1237 Give your preschoolers a head-start.

(2) ☐ **SUPERSTAT** v1.00 #E1238A-B Graph-based statistical package.

☐ **POLYGLOT** v6.01.06 #E1245 Build your vocabulary; SAT format.

☐ **ANIMALS** #E1249 Cheerful math tutor for preschoolers.

LANGUAGES

(3) ☐ **A86ASSEMBLER/D86 DEBUGGER** v3.10 #L1323A-B-C Machine Language.

☐ **SMALL C INTERPRETER** v1.3 #E1339 Ideal if familiar with BASIC.

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☐ **SURPASS** v1.0 #L1343 Excellent Turbo Pascal clone.

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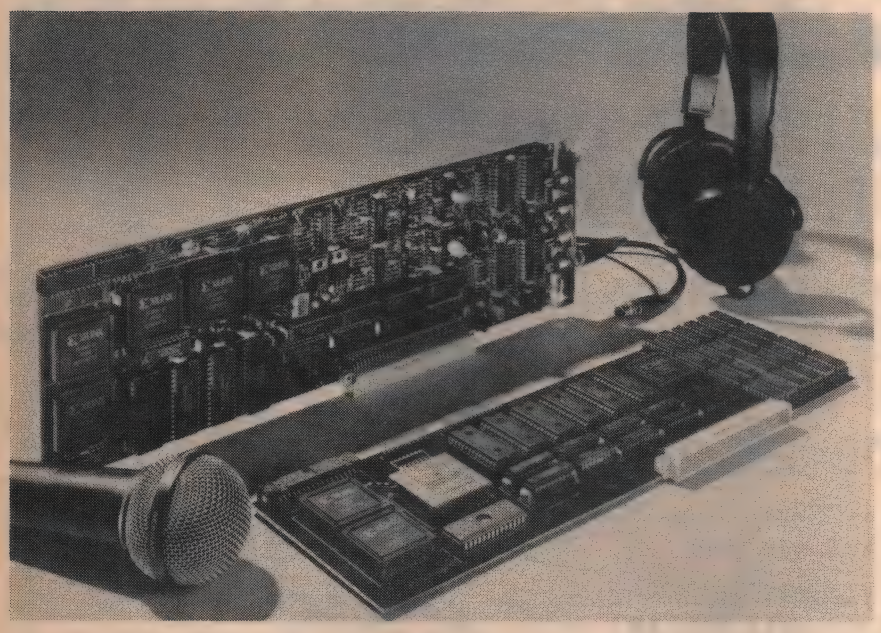
Max Audio For Macintosh II



Southworth Music Systems, Inc. has announced a remarkable new series of signal processing cards for Macintosh II NuBus systems, unprecedented in speed and quality for audio analog-to-digital and digital-to-analog applications. These cards can reproduce, analyze or synthesize digitally-stored audio with a fidelity better than that of compact disks. Each of the cards makes extensive use of parallel processing Motorola 56000 Signal Processing chips. A typical Max Audio configuration will enhance the computing ability of the Macintosh II by nearly seven hundred times. Typical applications of Max Audio include direct-to-disk recording and editing for audio post-production and digital mastering, real-time audio spectral analysis, sound effects cuing for video and motion picture production, algorithm development for sound synthesis and analog sensor data analysis.

The Max Audio Analog Card performs all A-D (Analog-to-Digital) and D-A (Digital-to-Analog) conversion using a proprietary 20-bit converter which provides 104db signal to noise ratio on recording and 120db signal to noise ratio on playback. The Analog Card supports sample rates of 44.1KHz (the standard CD sample rate), and 48KHz (DAT and professional recorders), 96KHz (2X oversampling), and 192KHz (4X oversampling). The card owes its compact design to extensive use of ultra-high speed signal processing to replace nearly all of the analog components of conventional converters. A-D conversion is performed by a custom ECL circuit which samples the input signal 24 million times per second and integrates the data to 192KHz. By operating well above the range of audio, the card is able to perform its function without the usual plethora of analog filtering components which take up space and contribute to signal distortion. The Analog Card has a suggested retail price of $1400, and is shipped with direct-to-disk recording and playback software and real-time stereo spectral analysis software (64 to 256 bands).

The Max Audio Quad 56000 DSP Card provides additional signal processing for such applications as reverberation and effects processing, frequency domain audio processing such as pitch tracking and pitch shifting, sample playing and additive synthesis. In addition to the onboard RAM on each 56000 chip, the Quad DSP Card provides an additional (optional) 3MB of shared memory for storage of audio samples. The Quad DSP Card operates at 68 MIPS (or more importantly for signal processing—68 million multiply/accumulate operations per second). The

continued on page 423

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Four New Products For Apple II Family

Springboard Software, Inc. introduced four new software products at AppleFest for Apple computer users in the business, education and home markets, including Springboard Publisher Version 2.0, a desktop publishing program. The four new products, available include:

• Springboard Publisher V2.0 (Apple II family): Advanced desktop publishing that integrates page layout, word processing and graphics creation in a single program. Version 2.0 offers all the features of Version 1.1 with many speed enhancements plus built-in laser support, streamlined keyboard commands, improved installation procedures, and AppleTalk network printer support. It also includes three dozen professionally-designed templates for fast newsletter creation.

• Family Matters (Apple II family): Intuitive database for storing and retrieving all of your important family information. Family Matters makes it a breeze to organize and keep track of all of those important papers that are piled in your closet/drawer/filing cabinet.

• Atlas Explorer (Apple II family): Complete world geography drill and practice program. Atlas Explorer will quiz you on any location plus facts about the location. Includes record keeping and review features ideal for home study or classroom.

• Art Converter (Apple II family): Surprisingly easy to use utility to translate artwork from any popular Apple IIe or IIc graphics format to any other popular Apple IIe or IIc graphics format. Cut the constraints on your clip-art collection!

Springboard Software, Inc. creates, markets and supports high-quality productivity and educational software for home, school and business use. Among its many titles are the best sellers, The Newsroom, Certificate Maker and Early Games for Young Children.

For additional information contact Springboard Software, Inc., 7808 Creekside Circle, Minneapolis, MN 55435; 612-944-3915. ●

Max Audio
continued from page 422

suggested retail price of the Quad DSP Card is $1400.

The Digital Audio/SMPTE Card is dual function. It is able to send and receive audio data in AES/EBU Digital Audio format for recording CD or DAT recorder data in digital form. The card also provides a SMPTE (Society of Motion Picture and Television Engineers standard) Time Code reader/generator which provides a means of locking the speed of playback or recording in the Macintosh to an external multitrack tape recorder or VCR. This card uses the same SMPTE reader technology as the Southworth JamBox, which has become the industry standard SMPTE/MIDI processor among professional musicians and recording studios. The card is able to trigger events to SMPTE Time Code with an accuracy of one microsecond. The Digital Audio/SMPTE Card has a suggested retail price of $995.

Southworth is actively encouraging third party software developers and has announced a Max Audio Certified Developer Program providing discounts on development hardware, licensing of drivers and software development tools, and free technical assistance in development of Max Audio applications. OEM and VAR discounts are available on all Max Audio products.

For additional information contact Southworth Music Systems, Inc., 91 Ann Lee Road, Harvard, MA 01451; (617) 772-9471. ●

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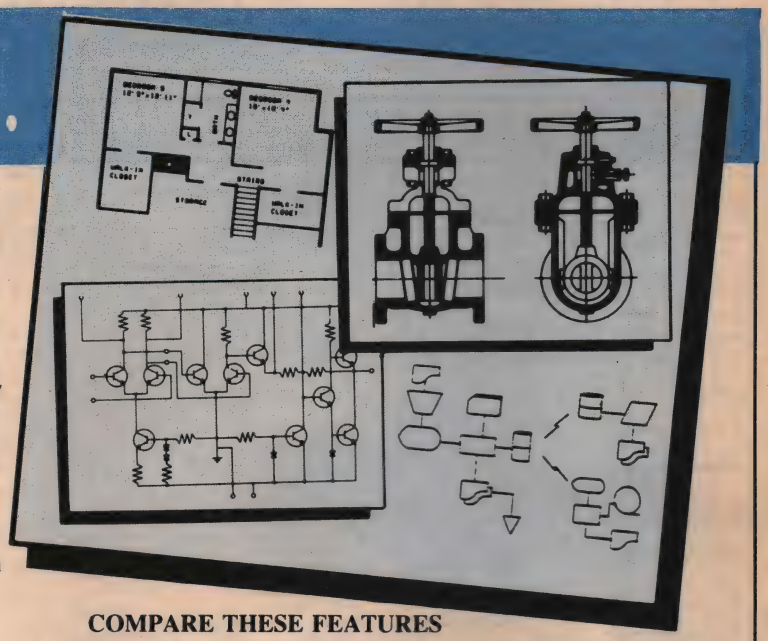

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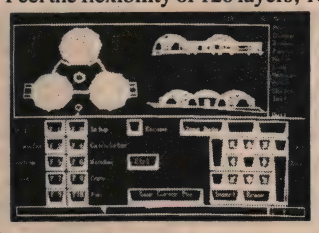

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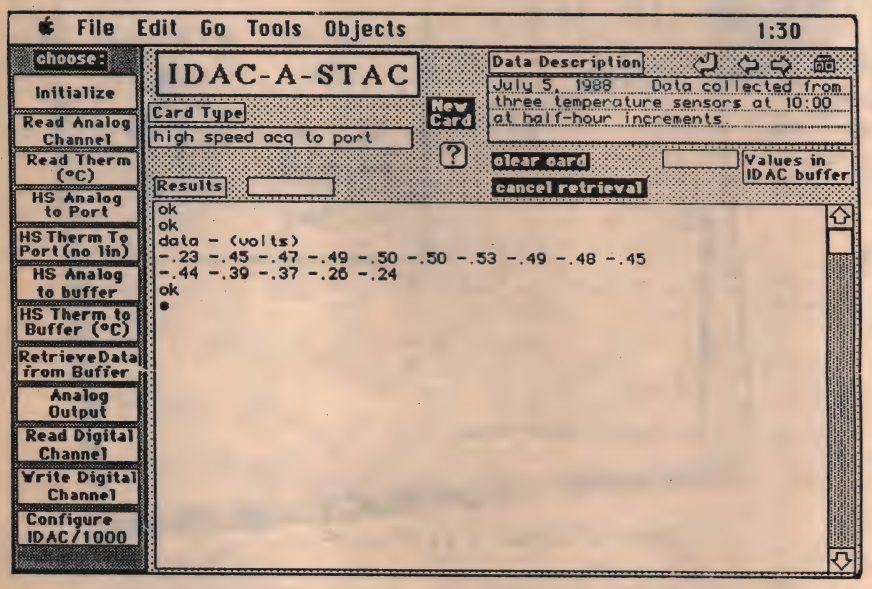
HyperCard Data Acquisition System

A HyperCard based data acquisition system which includes the IDAC-A-STAC data acquisition software and IDAC/1000 data acquisition peripheral that works with Apple Macintosh computers has been announced by International Data Acquisition & Control, Inc. (IDAC).

IDAC-A-STAC software is a HyperCard application that uses an almost universal metaphor for organizing information: the index card. Select the data acquisition function for execution and IDAC-A-STAC puts all the information at the user's fingertips. The user can collect and explore large amounts of information very quickly. Simply add a card for each data acquisition task and click on a button. IDAC-A-STAC puts the type of data acquisition function performed into the card, collects the data, puts it into the results portion of the card and then allows the user to enter a description for that particular card. For each data acquisition exercise, the user starts a new card in the stack.



IDAC-A-STAC can be used to start a long data acquisition run, exit HyperCard and do other work for several hours, and then come back into HyperCard and retrieve all the data that was collected by the IDAC/1000. The user can then search through the HyperCard stack for specific data on cards, print the results, move the data to other programs for analysis, etc.

According to IDAC President Gene Calvano, "IDAC has experienced a growing demand for low-end data acquisition on the Apple Macintosh. By using HyperCard as a base, data acquisition has now become simple with a standard user interface. Thousands of Apple Macintosh users can now take advantage of this data acquisition capability without having to learn any programming. It's an ideal system for use in university laboratories."

IDAC-A-STAC is based on the IDAC/1000 RS232C data acquisition peripheral. The IDAC/1000 stand-alone peripheral will capture eight channels of single-ended or four channels of differential analog input. Up to 16 channels of digital input/output are jumper-selectable for input or output in groups of eight. The product offers 12-bit analog/digital resolution and features a maximum sampling rate of 3600 conversions per second (aggregate) within voltage ranges of +/-10, +/-5, +/-2.5, 0-10, and 0-5 volts.

The IDAC/1000 has a standard buffer for storing 4,000 data points with optional expansion capability to 16,000 data points. The IDAC/1000 supports Type J, K, and T thermocouples and has standard screw terminals for connecting field signals. Mounting facilities are also provided for passive signal conditioning components. A variety of options are available to tailor the device to specific application requirements.

The complete IDAC-A-STAC system is priced at $1045 and includes the IDAC/1000 data acquisition peripheral, Macintosh cable, IDAC-A-STAC software and comes with a one year warranty on both hardware and software. For current IDAC/1000 users the IDAC-A-STAC software is priced at $75.

For more information, contact: IDAC, Inc., Four Limbo Lane, P.O. Box 397, Amherst, NH 03031; 603-673-0765. ●

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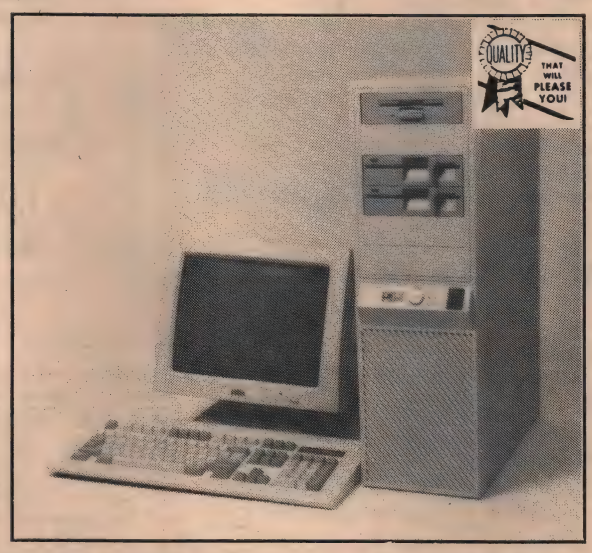

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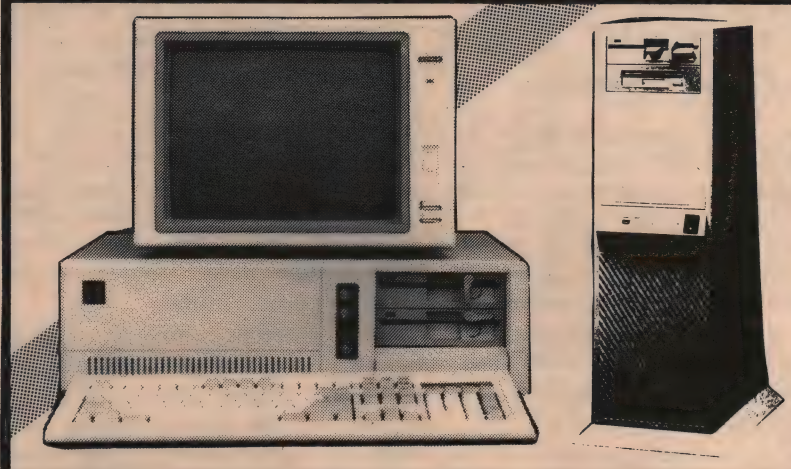

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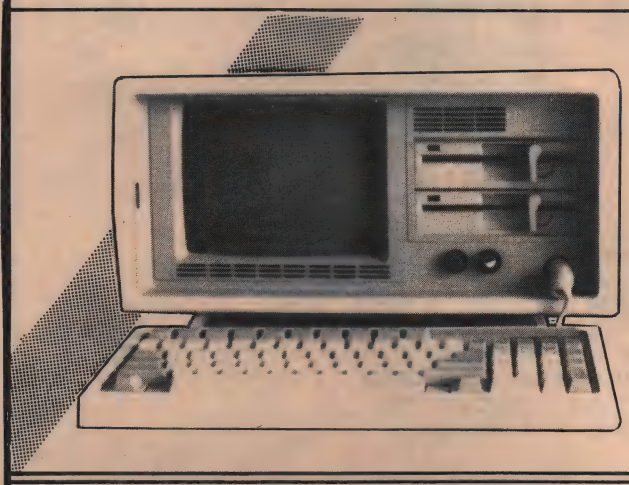

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VideoScape 3-D
continued from page 265

tougher than this. VideoScape is a true mental challenge of the highest order. Once configured, consider yourself a true Amiga power user! Of course, I am being sarcastic here, because overall I like VideoScape a lot. These are just the comments born of frustration. VideoScape is probably one of the most sophisticated 3-D animation programs out for the Amiga right now. But boy, is it hard! It has probably one of the steepest learning curves of any Amiga graphics software programs out now, making it a frustrating program for a beginner. I keep reminding myself when working with this program, that it could be much worse, I could be a computer novice again! Just try to plot a series of points on a multi-sided object and you will see what I mean! Not even Version 2.0, which we'll get into next, has made the task of 3-D animation and object designing any easier. It amazes me how much sophistication has gone into this program, and how much of it harkens back to the old days of software design. The user is left at many points doing all the hard work while the computer just sits there.

Well, if it is all this hard, then why don't you call Aegis for help? I did. They have a toll free number for technical assistance. When you call, you are told by an answering service that all the operators are busy (you can get this same message at 5:00 a.m. Saturday morning!). You are then told to leave your name, phone number, time, and problem. And that was the end of that. All in all, I chalk it all up to experienced gained in learning how to talk to answering machines—maybe that's why they didn't return my calls!

On the plus side, though, there are a wealth of 3-D object design programs that are coming on the market now. Programs like Mimetics 3-Demon, a full fledged 3-D object editor, producing files compatible with everybody else, and Interchange for converting Sculpt 3-D and VideoScape object files back and forth. There are even 3-D utilities emerging in the public domain. Also, for real tough problems, contacting a local users group can be a great help. So are leaving messages on a BBS. Now what about Version 2.0?

The New Improved VideoScape 3-D

As the outside of the package indicates, Version 2.0 is a major upgrade from Version 1.0. The big thing is Ham support, although Halfbright (64 color) modes is also supported. Along with medium and severe overscan, VideoScape now supports all graphics and resolution modes on the Amiga. Aegis has also upgraded its Showanim player program (Version 4.03) to play the new animations created in the new formats.

New surface textures are now included, with the two most important being chrome and glass (defined in VideoScape as "transparency"). Also, Phong dithering is now offered and will make straight polygon surfaces appear round and smooth. The new features are described as having "ray traced-like effects" and I agree with that. The Phong dithering on a sphere is perfect! These effects can only be achieved in the Ham mode, so make sure you have enough memory to manage it. My only complaint here is that Ham mode uses no algorithms for dithering out color fringing. Hence, Ham graphics come out looking a little trashy; even so, the graphics quality here is still very good. It's great to finally have Ham!

One new feature that I think is very important to Amiga users are the improved multi-tasking capabilities that Version 2.0 supports. For example, Aegis is coming out soon with new 3-D object editor programs that, when running in tandom with VideoScape, will allow object data files to be transferred between programs.

Other new features allow for different picture files to be loaded in at specified frames, Hierarchical object motion, multiple light sources each with different intensity levels, 50% reduction in Anim file size, and PAL video support, among others.

Hierarchical object motion is probably the most interesting of all the new things that VideoScape supports. This allows the user to specify by name a series of objects and have them move in tandem, relative to each other. In other words, you can place a rotating propellor on an airplane and have it "fly" through a scene. This looks very realistic! Before, you had to plot the path of both the propellor and the airplane, and then have the airplane chase the prop from behind.

One new feature that I found particularly interesting was the option to use a "Z Buffer" to render animations in. What the Z Buffer does is render each animation frame pixel by pixel,

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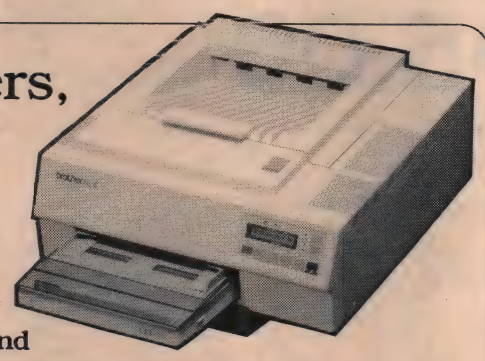

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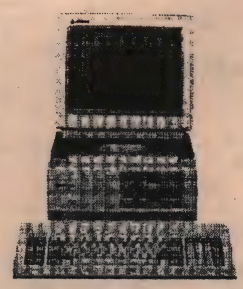

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Amigawars continued from page 265

the game's other actions: In a sudden flash of lightning, you might well see an enemy tank placing itself into position to fire at you. The storms were, in effect, just like real storms and while they were happening your radar went haywire.

Blizzards were almost as exciting: the world went white, your vision totally obscured by blowing snow. Now and then it might clear briefly, allowing you a glimpse of the terrain or the enemy, but those who were smart rode out blizzards by literally digging in—tunnelling into the snow being another feature of the Arctic Fox.

A quick-reference card guided you to the keys necessary for dropping land mines, firing cannon or firing seeing-eye missiles and as you made the appropriate move it was echoed by a pair of on-screen hands pushing the correct button on the control panel. As with the thunderstorm, it was a routine we'd not before seen on computers but it was one of those little things that tended to show we'd excercised extremely good judgement in purchasing an Amiga.

The seeing-eye missiles were also guided missiles. Fire one and watch from the missile's point of view on either the main monitor screen or the one built into your dash. Control of the missile was by cursor keys and thus it was sometimes expedient to fire one and curve it around a mountain to see what might be lurking on the other side. (It was also possible to fly a missile in a loop, thus getting a look at Arctic Fox from outside and above, but such moves are fatal.)

Added to all these routines and actions were the stereo sounds of tank treads swishing on snow, radar crackling from the effects of a storm, the warning sound when enemy radar was detected, and the incredible explosions of missiles and shells. With all this, a standard was set that would soon be realized in several other games.

Silent Service had performed on several other computers but never as well as it did when finally brought to the Amiga. In keeping with the corporate philosophy of MicroProse, Silent Service was not ported but was completely rewritten to take advantage of all the Amiga had to offer.

And Silent Service was a simulator in the best sense of the word: Not only did it simulate—as well as a computer can—the controls and actions of a submarine, it also offered several scenarios of varying difficulty, each closely based on a real situation from World War II.

A clever menu opens the game: you are standing in a control room that contains a periscope, a map table, a ladder leading down and a ladder leading up. With your mouse, you could direct your commander to navigation, down to the engine room, up to the bridge, or have him look through the periscope. Whatever your choice, the screen flipped and you were there almost on the instant, seeing now through the eyes of the commander.

In a typical scenario, you'd be trying to bushwhack an enemy convoy but that was only the beginning. Various reality levels could be set to make your mission more or less difficult and these levels included visibility or the lack of it; dud torpedoes or not; automatic repairs or not; and on through several other choices. No matter how successful you were, you could always make a mission a bit more difficult in order to test your skills.

When the enemy was engaged, you began to see graphic routines that did not exist in other versions of the game: torpedoes blew from tubes and created a wake across the water; ships hit caught fire and burned; deck guns exploded with sound; depth charges almost made your ears ring. Fight a long battle at night and you might be surprised at the beautiful sunrise that would follow—assuming you were still alive at dawn.

Because maneuvering at sea is sometimes a long and tedious process, the time rate of Silent Service could be speeded up by several factors—always reverting to normal when you were under attack—and this made the simulator probably a bit more fun than the real thing.

Time was a factor in another sense: it took real time to reload torpedo tubes and real time to effect repairs. If that doesn't seem like a big deal, try to imagine your submarine being hammered by depth charges while you're waiting to be brought back to a condition where you can fight or run away. It matters.

Like Arctic Fox before it, Silent Service introduced us to new routines, new

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Amigawars
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effects, new refinements in computer simulations. Not everything that came after these two were as good, though everything seemed to have at least some good points. Super Huey became the first helicopter simulation for the Amiga and while it was ported from the Commodore 64 it still offered good graphics and sound and a variety of missions.

Skyfox, too, was ported and in the process gained speed in the transition between air-to-air and air-to-ground missions. It also benefitted from stereo sound but suffered from a silly plot: aliens are attacking your planet and you, in the last Skyfox fighter, must stem the tide. On paper, it sounds no more silly than the plot of Arctic Fox but whereas the aliens of Skyfox attack in mindless waves, those of Arctic Fox seemed to have an intelligence that allowed them to feint and to take evasive action.

Before we could see that again, we had to wait for Jet from Sublogic. I've offered mild criticism of this program before on the grounds that the missions are a bit too existential: there is no beginning and no end, only a middle. Perhaps because Flight Simulator taught them that people were content to jump in a plane and fly from Chicago to Waukegan (with no real reason for going) they were led to believe we'd rejoice in launching from an aircraft carrier, battling enemy planes, then landing and doing it all again.

Well, as a matter of fact many of us are content but I would still have liked just a bit of story line and a definite end to a mission.

Having said that, I'll also say that Jet is one of only two good combat aircraft simulators for the Amiga (not that there are that many others). As such, it belongs on anyone's list of must-haves.

And I'll admit at the outset that jet gave me one of the most frightening moments in my long experience with flight simulators: In flying the land mission and checking out the features of the 3-D terrain, I spotted an airfield and decided to practice landing while checking out the ground features. I was still at a good altitude when I made this decision and as I was making my approach a flight of MiGs—fully formed, solid, 3-D MiGs—rose from the field to meet me. Perhaps that wouldn't frighten everyone, but it is a valid measure of how intense your concentration can become.

There are two aircrafts to be flown in Jet. The F-18 Hornet launches from and lands on an aircraft carrier and its missions are against aircraft or sea targets. The F-16 Falcon operates from a land base and fights aircraft or attempts to use bombs and missiles against such land targets as a nuclear reactor. Complete any mission and return to base and a slightly stiffer version of the mission waits to be flown.

In setting up for a mission, you choose the degree of difficulty as well as the armaments you wish to carry. Your main restriction is in the weight the aircraft can lift and while unlimited weapons might be a joy, you'll have to remember that an overloaded aircraft couldn't deliver them.

While the heads-up display of Jet is very good—though not accurate—you can enhance it in several ways: additional windows can be opened to show such things as a radar screen, a missile's-eye view and so on. In fact, I find Jet so quick in response to joystick movements that I deliberately slow it down by opening one or two windows.

When enemy aircraft appear, they are small dots in the distance. Turn on your targeting device and each dot is enclosed by brackets, the active target bracketed by red and the others by black. Fire a missile and the next target is automatically selected.

As aircraft come closer, they become solid objects and their speed through your cone of vision is such that you'll wish you could whip your head around to follow them. This is indeed a far cry from the wire-frame graphics of yesteryear.

For me, the most convincing sound in Jet—aside from the whining roar of the engine—is the sound of the cannon. Not even Hollywood accurately portrays the sound of modern high-speed guns—perhaps because it would be unrecognizable to those weaned on the machine guns of World War II—but Jet comes closer than anything else on a computer. Further, the sounds of explosions are the dull whumps one might expect and when heard through a set of stereo headphones they are very good.

As with other products from Sub-Logic, Jet is compatible with scenery disks and can utilize the Microsoft Flight Simulator as a scenic disk. With this in place, it is possible to buzz the Statue of Liberty, fly between the World Trade Towers at Mach 1.5, visit Chicago and wrap yourself around the Sears Tower.

The problem with scenery disks is that they are not real. While the buildings and obstacles appear to be there in full 3-D, they have no solidity: Aim for the Sears Tower and you'll fly right through it, with no crash routine taking place. Nor can weapons be used against the landmarks on scenic flights, though I suppose Hunter Thompson and myself are the only ones who would care about that.

In bringing modern combat aircraft to the Amiga, Jet paved the way for F/A18 Interceptor. The similarities are such that I halfway suspect the author of Interceptor was forced to write the

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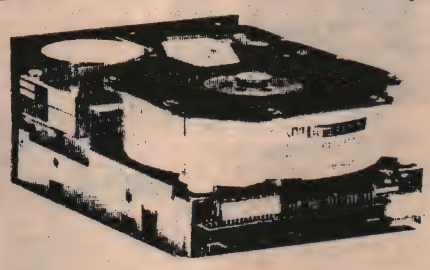

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producing better handling of intersecting polygons. Using this technique, one object can pass through another one, like a hot knife going through butter. This has some interesting possibilities, if you have the 300K of free RAM to support it.

Overall Review Of VideoScape 2.0

My biggest complaint with VideoScape isn't its complexity, although you can rack your brain trying to figure it out. My complaint is that it takes a lot of RAM to do the type of animations that I envisioned. I hate to buy software that needs more hardware to nurse it! I purchased this program to do animations in the interlace graphics mode, but that is an impossibility for now. And I have 1.5 megs under the hood! The package states that it requires 512K, but that is an incredible understatement. This program itself is such a RAM eater, that in 512K you would be limited to producing wire frame animations only. In 1 to 1.5 megs, you can produce lores 32 color and lores ham, but all other resolutions including overscan are out. I have found that even 1 megabyte isn't enough to create an animation with a single sphere with a mere 90 polygons on it! In 1.5 megs you can't do an animation in interlace or interlace overscan with an object of 9 polygons!

Documentation

Quite good this time. VideoScape's manual leads you through the major portions of the program clearly and concisely. A good index allows you to easily look up areas that might be giving you trouble. It is, however, severely lacking in tutorials. This is a major mistake considering the given complexity of this program. You can make up for this with the on-disk examples that are provided.

Despite my frustrations, I still like VideoScape 3-D. Version 2.0 includes many improvements over the original and makes VideoScape 3-D a major contender in the Amiga 3-D software market. It provides the quality of 3-D animation that I have longed for ever since I first purchased my Amiga several years ago. I have found over the years that when having problems with software programs, the main problems usually lie in the user—not the program itself. Given enough patience and RAM, you can do almost anything with this program.

VideoScape 3-D, Version 2.0. List price: $199.99. Requires 512K (1 to 2 megs for serious work), 2 drives (you can get by with just one).

For more information contact Aegis Development, 2210 Wilshire Blvd., Suite 277, Santa Monica, CA 90403. ●

Amigawars
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program he thought Jet would be—and did it, not necessarily from any sense of disappointment but in an effort to move the Amiga flight simulator just a bit farther along the path of realism.

The avowed purpose of Interceptor, according to the author, was to create the home computer equivalent of the multi-million dollar flight simulators used by the Department of Defense. How well he succeeded in that will be best determined by those who have flown for our armed forces. His success in bringing to the home computer the best of all flight simulators is by now an established fact.

Published by Electronic Arts, Interceptor reaches its high pinnacle by building on simulators that have gone before: there are definite missions as in Silent Service; there are multiple views (including views of the exterior of the craft) as in Jet; a heads-up display to rival the high mark set by Falcon for the Macintosh; carrier landings and take-offs as in Jet; extremely good sound effects as in Arctic Fox—and many routines strictly the property of Interceptor.

Each mission begins with an electronic message crawling across a map of the San Francisco Bay area. Once the mission is accepted, grid lines disappear and you have what might be a satellite view. The "camera"—your viewpoint—zooms in until a white dot off the coast becomes an aircraft carrier and continues zooming until you have a close-up view of an F-18 Hornet sitting on the launch ramp. The movie technique continues with the camera at deck level and making a dolly shot around the aircraft.

Now the view changes to the familiar view had by a pilot in the cockpit, before you a detailed instrument panel and superimposed on the windscreen the best heads-up display I've ever seen.

Your mission might be to shoot down MiGs that have fired on Air Force One; identify an unknown intruder; drop a rescue pod to a downed pilot; or force down two stolen F-16s being escorted by MiGs. There is no selectable level of difficulty, but when any scenario is replayed it will be more difficult than the previous time.

With Interceptor, you cannot just jump into a high-tech aircraft and start blazing away. There are practice sessions included and while they are not mandatory they will be helpful. You follow an instructor through the sky and emulate his moves as he takes you through maneuvers such as Immelmans, Split-Ss, loops and barrel rolls.

(It may be of interest to point out that only Interceptor and Chuck Yeager's Advanced Flight Trainer allow for two friendlies in the sky at once. Much extra programming is needed to produce a wingman, which also serves to explain why so many simulators have it as their scenario that you are the only survivor: see Harrier and Skyfox for Amiga examples of this.)

What is required by Interceptor is that you qualify by making a carrier landing. Until you can do this, you cannot fly combat missions. Although I've heard others say different, I think the landing routine in Interceptor is a bit more forgiving than the one in Jet—or it could be that I'm improving.

Control is a mixture of keyboard and joystick with the function keys controlling thrust and the numeric keypad controlling multiple views. One feature I especially like is that an alternate view will end automatically after about five seconds, returning you to the default forward view—a nice thing to have happen in the heat of combat.

The sound routines here are as good as those in Arctic Fox: you'll hear a lonely wind across the deck of the aircraft carrier; the whoosh of missiles being launched; satisfying explosions when a target is destroyed; good cannon sounds; and, most surprising of all, a sonic boom when you exceed 700 knots. More, the sounds change depending whether your view is from inside or outside the plane. That last may be unnecessary, but it speaks well for the attention to detail.

(It is also worthwhile to note that, though Interceptor will work with only 512K, you'll need at least 1 megabyte of memory to enjoy all the sound routines.)

As a mission is completed, a message to that effect will appear on your windscreen and you'll be directed to return to your carrier. Landing, and doing it in such a way that your arrestor hook grabs the restraining cables, is the real end of the mission and will figure in your final score.

When you're not flying combat, you may find it fun to explore the 3-D landscape of San Francisco. Flying under

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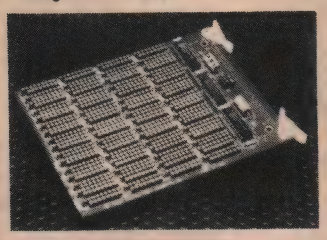

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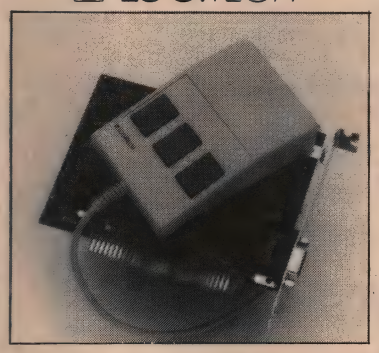

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Amigawars
continued from page 429

the Golden Gate and Oakland Bay bridges can be quite a challenge and you may even want to go over and shoot up the TransAmerica building. (Unlike Jet, your weapons will work on scenic flights but there will be no evidence of destruction to your target.)

With an almost foolproof piracy protection that involves a circular computer, Interceptor can be copied. I find this especially helpful in that I was able to make separate copies for my son and myself, thereby preventing him from lousing up my accumulated mission averages (or vice versa, according to him).

With Interceptor, the Amiga reaches a full fighting strength that may be hard to surpass. Each of the four simulators featured here has its own strength and its own reasons for being vital parts of your Amigawar library. As to the future, we can look forward to an Amiga version of Gunship, the helicopter simulation from MicroProse (who foolishly have wasted a year or more rewriting the program for lesser machines).

Whatever occurs, we can be sure that the Amiga, with only those programs available today, has become the outstanding computer for simulations of all kinds, easily outclassing any other computer on the market. It may not have surpassed the Evans-Sutherland flight simulator used by the Department of Defense, but the flip side of that statement is that the E-S can't run Arctic Fox.

Firms mentioned in this article: Electronic Arts at 1820 Gateway Drive in San Mateo, CA 94404—publishers of Artic Fox and FA/18 Interceptor.

MicroProse at 120 Lakefront Dr. in Hunt Valley, MD 21030—publishers of Silent Service.

Sublogic Corporation at 201 W. Springfield Ave. in Champaign, IL 61820—publisher of Jet. ●

PIXelations
continued from page 266

gadgets that all Amiga artists are used to—swap, exchange, spread, etc. "Range" is here too, which gives you the ability to do some really innovative color cycling work. Within some limited boundaries (prefigured by the fact that this version of the software only shows you the sixteen color palette of HAM images), you can do a limited amount of color cycling in a HAM image. This alone makes the software worth the price for me. I hope this is expanded upon in future upgrades, as all other developers have told me this was "impossible." But, full overscan painting was "impossible" until just a few months ago.

Next up on the list is an option called "Color Bias" which allows you to work on the picture globally (all at once). A sample of these changes may be seen in Figure 5. The only complaint I have here is that some movements of the sliders disappear the menu itself. The choices and sliders are used to adjust the Red, Blue, and Green values, as well as Contrast, Saturation, and Intensity. You can achieve an almost unlimited amount of picture variation by these sliders alone, although unpredictable effects are achieved when operating on HAM images. Once you've chosen the desired parameters, you can either "use" them or "undo" them.

"Packing Colors" is really useful in

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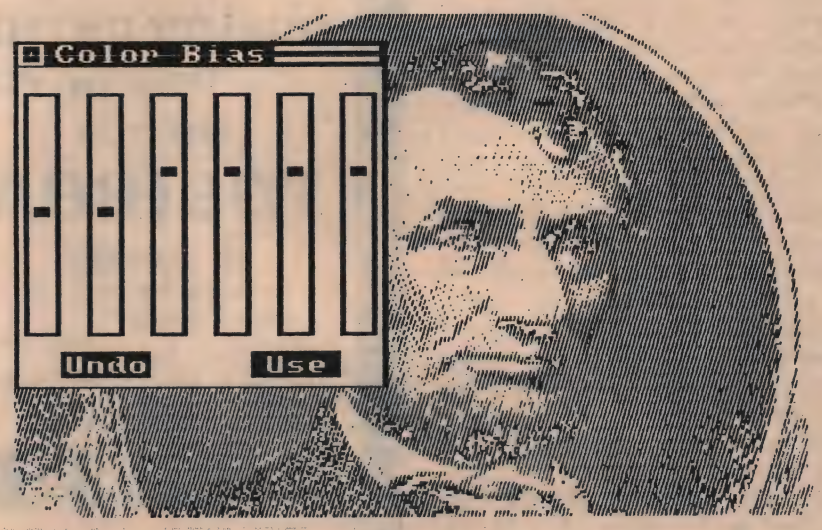

Figure 5

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The Amiga Workbench

by Ervin Bobo

I've always had a difficult time understanding the fascination with and the antecedents of war games. At one time these games were played on real boards with real tiles and markers and I suppose both sides had to be controlled by humans. Further, the only sound effects possible were those you could make with your throat—perhaps a high-pitched scream or an explosive sound at an unexpected moment, anything to unnerve your opponent.

Then computer versions came along and the first thing they gave you was an opponent who doesn't mind staying up until 3 a.m. As an afterthought, some threw in sound effects and some were programmed so that tiles and markers looked like the artillery or air power they represented.

So much for the antecedents. Computer war games now exist as a category of software that is growing by leaps and bounds, obviously appealing to a large segment of users, and still less than understood by me.

Perhaps the challenge is to change history by defeating the computer (in which case you must guide the historical loser to victory) or to see whether you can keep history intact by doing the same thing (in which case you'll control the historical victor against a foe more savy than history was able to produce).

Then again, the challenge may be to play against a human opponent who is not bright enough to know the winner of a particular battle and induce him to play the losing side. ("Go ahead and take the Rebs, Frank. Sure, they had less men than the Yanks, but everyone knows a Rebel can whip three Yankees.")

I'll confess to my own dream: Although I'm not an expert on the Civil War, I've read *The Killer Angels* by Michael Shaara three or four times (and I recommend it to those who will play the game and to those who will not). So I remember a few things about the battle of Gettysburg and when I first looked over my copy of "Gettysburg:: The Turning Point," the ideas that popped into my head were these: Suppose Jeb Stuart had been there to harass the Union rear? And suppose Pickett's Charge was instead turned into a pincher movement? Would the outcome be different?

I'll probably never know.

To my knowledge, Gettsburg from Strategic Simulations is the first war game for the Amiga but it certainly won't be the last. Because of what the Amiga can do, movements and battlefield updates are faster than anything I've seen elsewhere; sound effects (musket and cannon fire) are believable; and even a bit of synthetic speech has been added: when a unit is overwhelmed and routed, you'll hear the men yelling "Run away!"

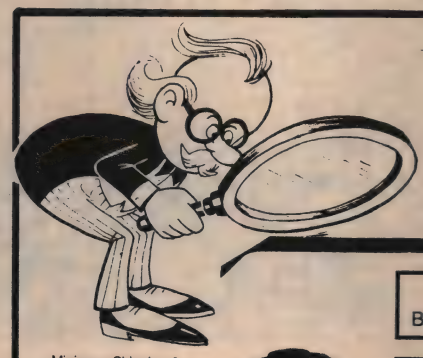
For all that, it is not easy to change history.

You can play at one of three levels and play against the computer or a human opponent. You can also elect to fight the entire battle or to begin on a particular day. In any event, you'll then be presented with a screen showing a section of the battlefield and the screen scrolls smoothly to show the entire area of conflict.

Now you begin moving units into position and although the mouse can be used I found it easier to use the numeric keypad. Because of the superior Amiga graphics, troops look like troops; holding rifles ready when advancing or at shoulder arms when retreating. Cannons look like cannons and the cavalry (optional, but not historic) are mounted on horses. Further, the terrain is shaded to show three levels of elevation, a good thing to know in a battle where control of the high ground largely determined the winner.

A large map on heavy laminated stock helps you to know where you are on the video battlefield and the idea is to move units into place against the

continued on page 434



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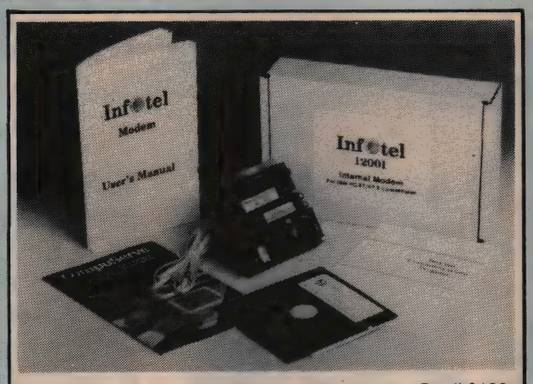

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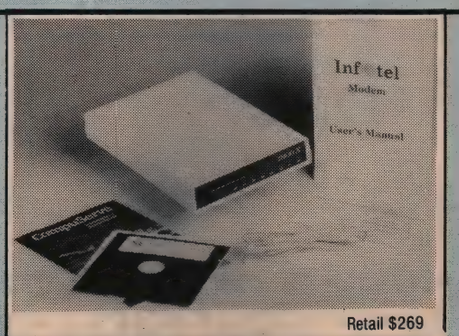

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The Amiga Workbench continued from page 431

enemy. As you select a unit, information about it is displayed in a box below the main screen. You'll be told the name of the commanding officer, the strength and morale of the unit, the amount of ammunition and more. Once you've moved the unit (each representing two regiments or up to four batteries of guns) you also choose whether the infantry units will melee.

Turning a noun into a verb is not my idea, but as used here "to melee" seems to mean to engage with rifle and bayonet.

If you're playing the computer, the computer moves first and does so too quickly to follow. No matter, your only concern is where units end up, not how they got there. Following your own moves (infantry first, then cavalry and lastly cannon) you may choose to enter combat. You're asked for a confirmation on this and then the battle begins.

First will come the cannon fire from both sides and then the infantry melees. The legends at screen bottom tell you who is firing at whom and tells you of the casualties incurred and prisoners taken. At the end of the turn, you'll be asked whether you wish to save the game. If not, go on to the next series of moves. From time to time, all this action is digested into an arcane scoring system in which negative numbers will denote a minor or decisive victory for the South and positive numbers denote the quality of victory for the North.

Again, I think this matters little. The bottom line means something only when the battle is done and at that point the scoring will be clear on who won or lost. Following this screen, you'll go through others that present you with the statistics on number of men killed, wounded or captured for both sides. Then it's back to the battlefield to plot your next moves.

So why not turn Pickett's Charge into a pincher movement? It is the difficulty of moving units where you want them to be. Progress is slow and units may only be moved a few squares at a time. Go too far and you'll be told the move is impossible or that the unit you are trying to move lacks operation points. (In a fine sense, one could argue that acquiring the necessary experience might decimate the troop and thus make it useless for moving anywhere, but I hate to argue with a computer.)

Anyway, what you envision as a grand sweeping movement becomes moving regiments only a few hundred yards at a time. (Unless you are a computer: for reasons not clear to me, the computer does move Union troops in great sweeps.)

A further difficulty is that it is impossible to tell in which direction your units are facing. Presumably they will attack toward their own front, but they are all facing right (Union troops face left) and although there is a "Facing" option the units keep looking the same way. Several times I had Rebel troops behind Union lines and as far as I know they are still advancing on Lake Erie.

Forget the documentation that tells you the icons will turn about when the Facing option is used. It doesn't happen on the Amiga but is perhaps an option on one of the other computers covered in the all-purpose manual.

You may use a "Target" option to direct your unit against a particular segment of the enemy and this is probably better than the Facing option.

Anyway, in trying to change history I had not the cavalry of Jeb Stuart but that of Fitzhugh Lee. Not that it matters a great deal; they can be moved only three or four grid squares at a time, as is the case with foot soldiers. Since each square represents 200 yards, it can take most of the day (with many skirmishes) to get them from Cemetery Hill to Little Round Top.

It may also take some time to decipher the documentation. War games are complex and Gettysburg is no exception. To this complexity has been added the handicap of a manual written for all computers and specific to none. (There is an Amiga reference sheet, included as an afterthought.) My advice is to first experiment with the game and see how mouse clicks substitute for the numerous keyboard commands listed in the manual.

In the end, you're forced to admit that the game is so solidly based on real history and the real capabilities of the armies involved that you'll probably never change the outcome by playing against the computer. The grand sweep of clashing armies becomes a series of small moves by relatively small groups of men and while it is certainly possible to fashion from these a grand

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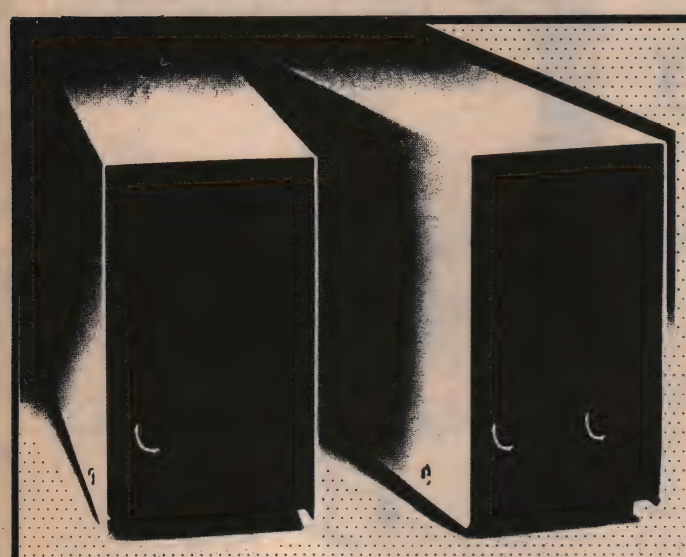

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The Amiga Workbench continued from page 434

strategy, you must remember that the computer thinks faster than you do.

If you want to change the outcome of the Battle of Gettysburg, probably the best way is to play the Union side and deliberately mismanage things: instead of fortifying the high ground, keep charging the Rebel lines.

Whatever you do, Gettysburg, The Turning Point, is probably the best place to do it. The game is a product of Strategic Simulations, Inc. and is available from Electronic Arts through their affiliated labels program. The address is 1820 Gateway Drive in San Mateo, CA 94404. Suggested list price is $59.95 and the game requires 512K of memory.

World Tour Golf, which has been around for a few years in other computer formats, has just been introduced for the Amiga. The approach to the graphics is a bit different than other golf games I've played, better in some respects and not as good in others.

The strong points of the game are that it offers about a dozen courses upon which to test your skills and one of them—Fantasy—is the stuff of nightmares. The vertically split screen gives a rather distant view of your golfer and the fairway on the right, while the left side is devoted to an overhead view of the hole you are playing. The advantage here is that you have a constant double view of your ball travel, without the necessity of flipping screens.

At the lower right corner of the action screen is a circular device that measures backswing and aim. Click the left mouse button to begin moving the backswing pointer, click again to end it and then—if you want to fire the ball straight ahead—click again when the pointer reaches the six o'clock position.

You'll see the ball arcing out ahead of your golfer while the overview screen shows you it's distance down the fairway. After a minute, the right screen will change to show you at your new position and at this point you should select a new club.

At the top of the action screen is the club selector as well as legends for wind direction, number of strokes taken, par number, wind velocity and direction and the relative worth of your current position. Following the playing of a hole, the entire screen changes to show the scorecard.

If you make a hole in par, the crowd will cheer softly; do anything else and they'll moan with you. These sounds are done through synthesized speech while those things uttered by your golfer are presented as comic-strip balloons. Just as well, for some of the latter comments are profane.

In playing, you'll find the amount of backswing needed will vary depending upon the club in use and depending upon whether you are in the rough, on the fairway or mired in a sand trap. On the putting green, markers will show you the slope of ground (how it breaks) and you'll also want to pay attention to wind direction.

While putting, only two mouse clicks are used, the first for the force of the blow and the second for aiming. Click to either right or left of the six o'clock position and the ball will pull in that direction.

Taken all together, World Tour Golf is a good computer interpretation of the game and the numerous courses available mean it will be some time before you exhaust all the possibilities for entertainment. The game is available from Electronic Arts and 512K is required. Suggested list price is $39.95.

Briefly Noted

Wico, a company probably responsible for half the joysticks in use today, has just introduced the ErgoStick. Contoured to snuggle into your left hand, the joystick further strives for comfort in being covered with what seems to be rubber, but that looks and feels almost like warm suede.

In use, the fire button rests naturally under your left forefinger and the microswitch stick gives a tactile feedback when moved. In testing it, I relied heavily on F-18 Interceptor, a game where the presence of "slop" would be critical. The ErgoStick was always tight and responsive. It's a good one.

ErgoStick is available from Wico Corporation at 6400 W. Gross Point Rd. in Niles, Illinois 60648. List price was not available at this writing.

Freedom Stick is a wireless joystick from Camerica. Consisting of a sending unit—the joystick—and a receiver, Freedom Stick allows for play from a distance of up to twenty feet.

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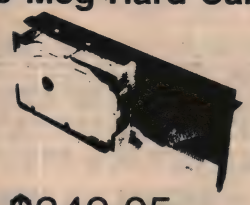

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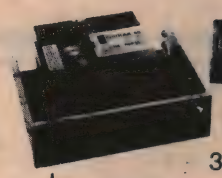

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PIXelations
continued from page 430

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Figure 6

Figure 8

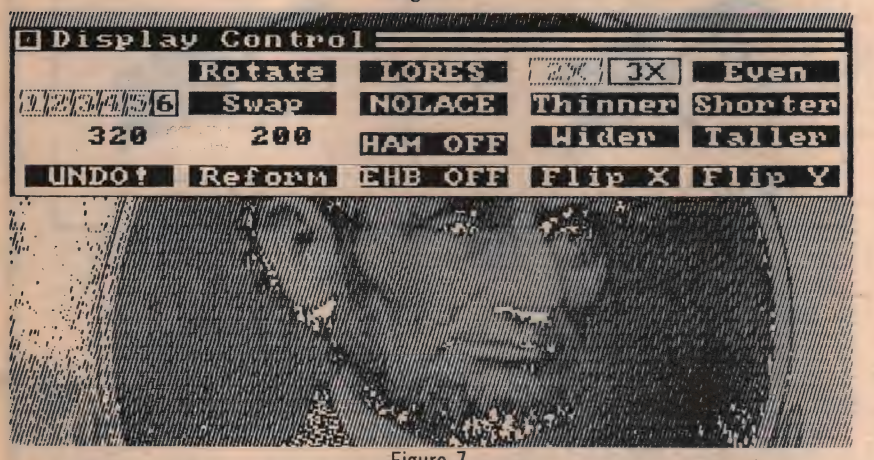
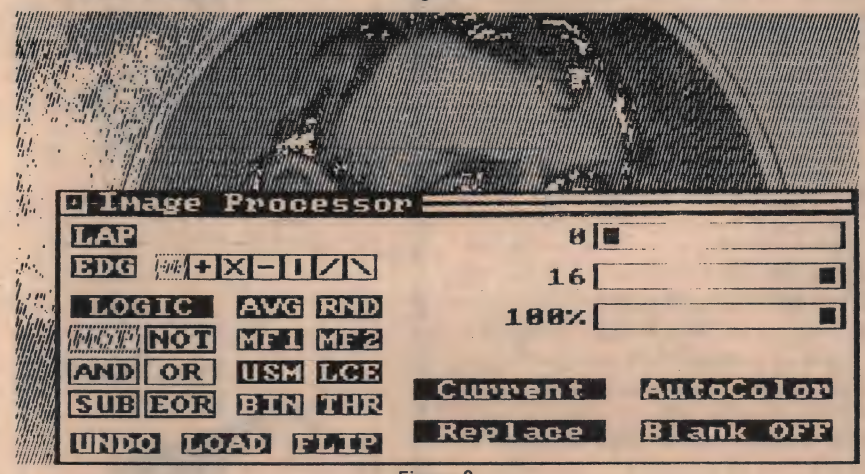


Figure 7



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PIXelations
continued from page 436

the automatic RGB and CMY extractions, which saves your final work in separate IFF color separated files. Sufficient RAM is needed for all of these. Color separated files can be automatically merged to get back a full color image on the screen, and unique specialized merges can be controlled.

HAM images can be converted to thirty-two or sixty-four (extra-halfbrite) lores images very quickly, and vice versa.

Then there are a number of alternatives that allow the Amigartist to mix and match the image with other color palettes, including copying the palette to another screen and exchanging palettes between screens. "Complementing Colors" (see Figure 6 on page 436) gives you an instant negative of the screen. You can also use "Pseudo Color" to twist the palette even further.

Next, we come to the "EFFECTS MENU" in the menu bar. Four possibilities are offered here: DISPLAY; IMAGE PROCESS; HISTOGRAPH EQ; and ReFormat As. These possibilities up the ante of variable out-

continued on page 442

Figure 10

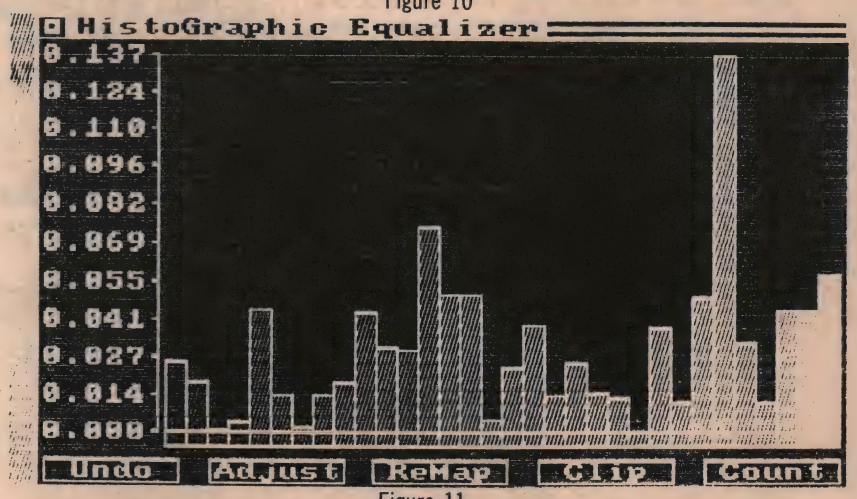

Figure 11

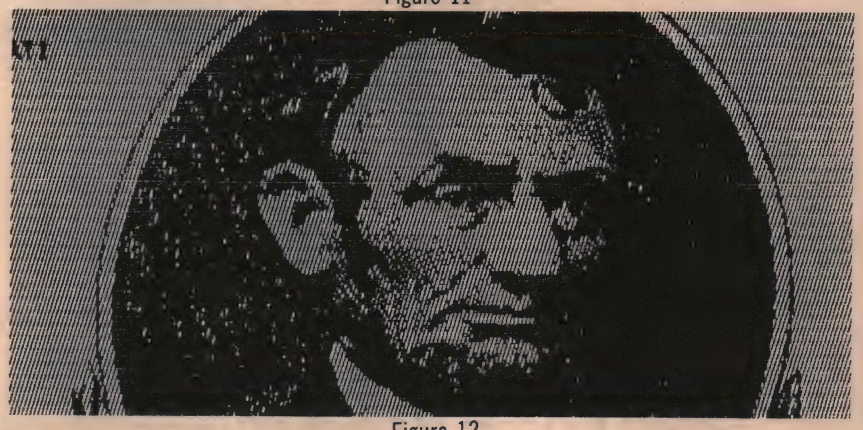

Figure 12

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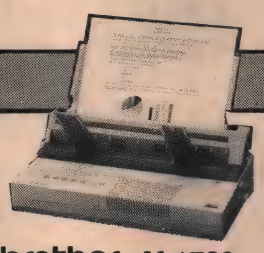

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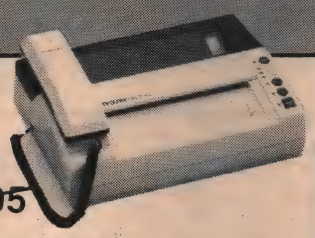

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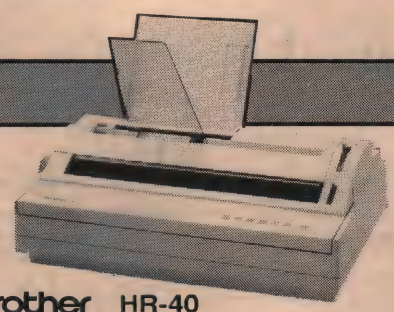

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It's In The Cards—Solitaire Royale For The Amiga And Mac II

Reviewed by Cheryl Peterson

When comparing two versions of the same game running on two different machines, it's usually easy to say that one is better than the other. Unless of course, they are exactly the same. But in the case of Solitaire Royale, things aren't that simple. Though the versions are similar, there are few telling differences.

For the most part, the features are the same. Both games offer many choices of decks with unique back designs and face cards. The artwork for each version was created independently so the cards have only a superficial resemblance. For instance, both offer a Japanese layout, but the actual design of each is totally different. With the variety offered you'll never get tired of seeing the same old cards.

One of the chief differences between the two programs is related to the artwork. The size of the cards on the Macintosh version is about an inch and a half tall by an inch wide, where on the Amiga the cards are closer to two and a quarter inches tall by an inch and a half wide. The finer resolution used on the Macintosh makes the cards look nicer, but because of their small size they are harder to read. Where the Amiga cards are easily visible from several feet away, you need to sit closer to the Macintosh to clearer differentiate the cards. Depending on how comfortable you want to be while you are playing this can mean nothing or everything to you. I found it much more enjoyable to sit back and relax while playing the Amiga version.

Even with the smaller size of the cards on the Macintosh version, the game is still a blast to play. In fact, while a Solitaire game would seem to be a program that would quickly get boring, Solitaire Royale ages well. Even with several weeks of playing, I find myself loading it up whenever I have a few spare minutes. Here's why.

Solitaire Royale is actually a whole series of Solitaire games. There are eight different versions of Solitaire; Three Shuffles and a Draw, Pyramid, Golf, Klondike, Canfield, Corners, Calculation and Reno. All of these can be played repeatedly with ease. In addition, they can be played in a rotation called Aunt Anne's Tour. When you choose the tour, you play each of the games once and then score is kept by how many cards you manage to put into play—up to a total of 52. A perfect score would be 416, but don't expect to win all eight games. They are tough.

While a deck of cards would obvious-

continued on page 440

The Amiga Workbench
continued from page 435

the Amiga/Commodore computers as well as one for Nintendo/Sega games. In practice, the receiving unit should sit atop your monitor but I found the adapter cord too short when plugged into an Amiga 1000.

Yet placement is critical at short distances because the sending unit sends out a narrow beam with a slight upward slant: if the receiver is not correctly positioned, you'll find yourself losing contact and the game as well.

At the longer distances for which it was designed, the infrared beam can be bounced off walls, ceilings or your kid brother and under these circumstances everything works well.

Freedom Stick is configurable for one or two players, has a nice feel and is not a great stick but a good one. Though the sending unit is larger than other joysticks for the Amiga, it rests comfortably on your lap. Possibilities are certainly intriguing, but I think the beam should be broadened to ensure better continous contact at close distances.

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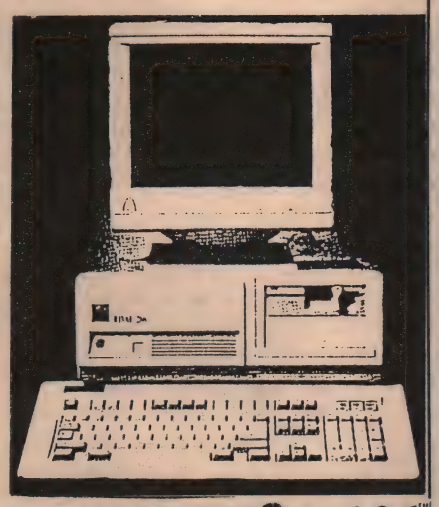

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Inkwell Systems Releases New Amiga Light Pen And Driver

Inkwell Systems, the manufacturer of high resolution graphics software programs for the Commodore 64, 64C, SX64 and 128/64 computers has announced the release of the new Amiga Light Pen and Driver. The Model 184-A light pen, coupled with its transparent driver provides an easy to use, natural alternative for data entry.

The new Amiga Light Pen Driver works through CLI or Workbench in either interlace or non-interlace modes with Amiga's most popular mouse-driven programs. There is an easy to use help manual included on the disk.

The 184-A Light Pen is plug compatible with Amiga 500, 1000, 2000 and A2000 (German version) computers. The 184-A Light Pen is lightweight and features two touch actuated switches which, when used in conjunction with the new Amiga Light Pen Driver, can replace or be alternately used with the two-button mouse for the ultimate in data entry control.

The Amiga Light Pen Driver coupled with the 184-A Light Pen is ideal for use with painting, drawing, free-hand sketching, CAD and other Amiga software programs.

Inquiries for further information or dealer/distributor price schedules can be directed to Inkwell systems, 5710 Ruffin Road, San Diego, California 92123: (619) 268-8792 or by Fax (619) 268-8979. ●

It's In The Cards
continued from page 439

ly be cheaper than buying this program, Solitaire Royale does offer a few features you'll find hard to duplicate with the traditional deck. You can take back your last move and keep doing it all the way back to the beginning of the game if you wish. Or you can merely start the same game over using a menu option—the program remembers the layout for the current game for you, so you can replay the game over and over until you finally win it. (This option is disabled when you play Aunt Anne's Tour or are engaging in a tournament.)

Another improvement over a deck of cards is the ability for several people to play the same game. In tournament mode, the program remembers the game and tracks the scores of those competing in the tournament. You can choose any of the games for your tournament or you can choose the Tour and make it really tough. Playing the Tour can take a couple of hours, so expect a Tour Tournament to be a week-long affair.

If that weren't enough, there are also three special card games for children to play. The traditional "concentration" game where the two players take turns revealing two cards at a time and trying to make matching pairs is geared to one or two players. The other two children's games are true "Solitaire" games.

The documentation is excellent. Though I was familiar with only three of the five games available for adults, I had no trouble learning the others by reading the documentation. The illustrations are very well done. It should be noted that the Amiga version of the game contains the Macintosh instructions with a separate card showing the Amiga differences. Nevertheless, the instructions are quite adequate and I enjoyed reading through them. A glossary section explains the terms used in the explanations of each team.

I actually enjoyed the games with which I was unfamiliar as much as I did those that I had been playing since childhood. Their newness made them a bit more exciting than the old tried and true games. Playing the Tour is great fun if you can set aside several hours to dedicate to it.

One interesting difference between the two games that I wish had not been made is in the Tour mode. In the Macintosh version you can specify which game you wish to play first and then progress through the other in a set order. In the Amiga version, you also must progress through in a set order, but you cannot determine which game is played first. You must progress from Pyramid to Golf to Klondike, etc. But this is only a minor inconvenience.

One other slight difference is the soundtrack played when you win one of the games. Both games offer a cute little graphic which I will not describe so that I won't spoil the surprise. The applause for your success is very nice, though.

I really enjoyed this game and it sits at the top of my pile of leisure-activity disks, just above Rogue. I admit that I expected to be non-plussed. But the wide variety of games offered and the excellence with which they are done has made me an avid fan. And any game that can grab my five-year-old's attention and keep her busy for an hour or more is easily worth the money.

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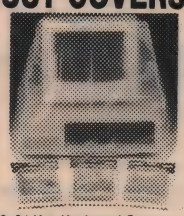

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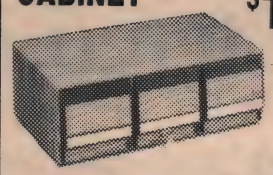

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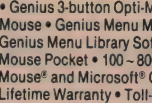

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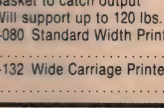

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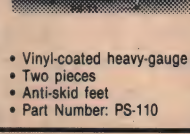

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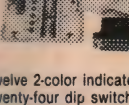

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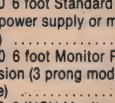

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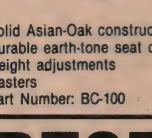

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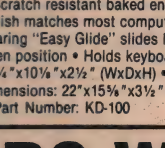

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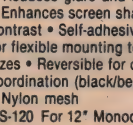

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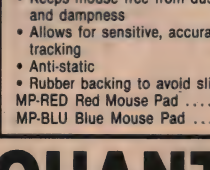

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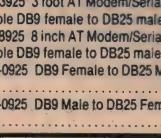

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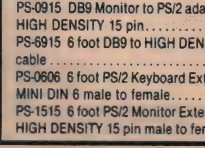
RS-232 MALE TO MALE CABLES



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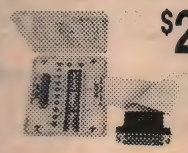

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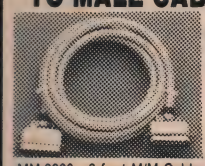

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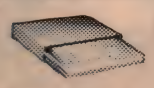

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Haitex Resources, Inc. introduces low cost, high technology for stereoscopic 3D viewing. With the X-Specs 3D glasses cabled to a computer, images can be viewed with the depth of real life 3D.

The word "stereoscopic" is applied to three-dimensional visual images in the same way that "stereophonic" is used when referring to multi-dimensional audio images.

Human vision works with two eyes each viewing flat pictures from slightly different angles. The brain combines these two flat images into one collective stereoscopic image with 3D depth.

With the use of the X-Specs 3D glasses, the computer can display a flat image to each eye independently and trick the brain into constructing a stereoscopic 3D image. The results are incredibly lifelike.

The X-Specs glasses control what each eye sees independently by closing and opening an optical shutter at 60 frames per second. The optical shutter employs a high-speed liquid crystal.

The initial introduction for X-Specs 3D is for use with the Commodore Amiga. The exceptional graphics power of the Amiga system at a low price point makes it an ideal format to introduce this technology.

The potential applications for stereoscopic imaging are as unlimited as vision itself. Doctors at the UCLA Medical Center in California are utilizing X-Specs 3D for magnetic resonance brain scan imaging. The chemistry department of the University of Cincinnati in Ohio and Scripps Labs in California are employing X-Specs and Amigas for molecular modeling. Other users and developers are investigating applications in art, architectural design, flight simulation, 3D modelling, ray tracing, optometry, and adventure games to name just a few.

The entertainment possibilities are spectacular. A game named SpaceSpuds has been packaged with the Amiga version of X-Specs. SpaceSpuds, developed by John Schultz, combines exciting arcade action with incredible realistic depth in star-filled outer space. Over forty independent software development firms are working on X-Specs 3D compatible Amiga software.

A software program termed "D3D" allows any pair of Amiga "IFF" standard images to be displayed with the X-Specs stereoscopic glasses. Three-D rendering software, such as Sculpt 3D and Turbo Silver, can be employed to generate stereoscopic pairs by first rendering a scene for one eye, and then by moving the "camera angle" a short distance, an image may be rendered for the second eye. Images may also be created by digitizing existing pairs of stereoscopic photographs.

Commodore 64, IBM PC/AT, Macintosh and VCR interfaces are in development. The Amiga version of X-Specs 3D retails for $124.95. The system includes one pair of glasses, an interface that supports up to two pairs of glasses, a disk full of 3D images and the game SpaceSpuds. The X-Specs 3D Amiga interface simply plugs into the second joystick port and requires no additional power supply.

For additional information, contact Haitex Resources, 208 Carrollton Park, Suite 1207, Carrollton, Texas 75006; (214) 241-8030. ●

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PIXelations

continued from page 438

comes. The display control offers some esoteric choices, and has to be played with to achieve familiarity. The "Display Control" (see Figure 7) has a number of parameters. You can slice and recombine the BIT Planes, rotate the image, and change resolutions. You can crop it to your hearts desire. Other graphics modes can be produced here, but the image will be either expanded beyond the screen or shrunk accordingly. To keep the same image area, choose "ReFormat As...," which gives you the four common resolution choices. There are gadgets to make the image either taller or shorter to various degrees, some results of which are shown in Figure 8. See Figures 7-9 on page 436.

In the "Image Processor" window are a number of buttons and gadgets that do unexpected things to the picture. Logical operands on the left (see Figure 9) do things the manual is even unclear describing, prompting you to experiment on your own. Two screens may be combined in several ways. A single screen can also be reconfigured. I chose the "LAP" function to get the woodcut look in Figure 10. You've really got to experiment here to achieve an ease of operation. No two images seem to respond to a gadget in the same fashion. It might be helpful if Progressive Peripherals had a print out of some of the resulting choices on one image, not that experimentation isn't fun. The effects can be fine-tuned by using the sliders to determine the degree to which the operations will be used. The manual warns you that "full color processing uses enormous amounts of CHIP RAM in HI-RES and HI-RES Lace modes," so users beware! By the way, if you use "EDGE" and turn your video recorder on, the image will do some astounding tricks in front of your eyes, except for the unwanted "zzz" sprite.

Even more? Yes! Even more. The "Histographic Equalizer" window takes a second or two to appear on screen. When it does, you are presented with a histogram of the color palette. You can also bring up the "Count" screen, which gives you a number and percentage count of the colors in the palette (remember that in HAM pics, only sixteen are presented). After using the "HAM to 32" conversion in the color menu, the "ADJUST" and "REMAP" options become active in the histogram. (see Figure 11). The feel here is akin to using a graphic equalizer in an audio system. You can adjust and remap freehand curves that in turn alter the status of the image. You can spend hours on this magic! A sample in gray scale of an altered image is presented in Figure 12. See Figures 10-12 on page 438.

All in all, I find PIXmate to be an excellent choice for securing a place in your graphics enhancement collection. It has some very different features then "BUTCHER," its nearest competitor (about $25.00 from Eagle Tree Software, P.O. Box 164, Hopewell, VA 23860; (804) 452-0623). Butcher has some superior functions that PIXmate might redress in the future. Among these is the ability to do painting in all but the HAM resolutions and the ability to save "clips" (brushes) as well as to load them and move them around the screen. Personally, if Progressive Peripherals just did more work with HAM color cycling in the next upgrade, I'd be more then happy. I personally favor "BUTCHER" at this time for desktop publishing needs and PIXmate for video work, but you might decide the opposite or something else entirely. HAM palette manipulations are tricky because of the way that HAM resides on the screen, so color manipulations produce strange results. I'm continuing to experiment with PIXmate and can't wait to see what the next version offers. ●

A Genius
continued from page 273

C, not assembly language. As a result, it can be unnecessarily slow. Most compiled C code is not optimized, so many logical functions are performed redundantly. With GDOS installed in the ST, all graphics calls to the VDI are intercepted and checked to see if GDOS can be of any help. Generally it can't, so the entire graphics system slows down as a result of GDOS' presumed generosity.

Here is where Charles Johnson enters our story. "One day," he begins, "I was sitting down playing with EasyDraw, and I've always been frustrated by the speed. I finally realized that it was not EasyDraw's fault that moving through the drop-down menus was sluggish, and dragging a box was slow. It was really GDOS' fault. You can see the slowdown on the Desktop too, particularly when you have several accessories installed. So I finally got really fed up and I started trying to figure out what it was that GDOS was doing—which I think is something that most people still don't know. There's a very murky idea in most people's minds of what GDOS is actually supposed to do—which is kind of unfortunate.

"So I actually started tearing into GDOS itself, seeing what it was doing to the system while I had programs running. From there, we [Johnson and Eidsvoog] took it backwards and reverse-engineered the whole process of what happens when you're sitting in there, translating the VDI calls from one device to another device.

"As we were digging deeper," Charles continues, "into what the system itself was doing all the time, we realized that there was a lot of extraneous stuff going on—stuff which did not affect anything. When we make a statement like that, the first impulse is always to say, 'How do you know it might not affect something down the line that you didn't check out?' We really did check this out very thoroughly. What we discovered was there were some redundant calls coming through the system. So one thing that G+Plus does is to manage that stuff a little bit more intelligently, so things can happen a little more quickly. Some of these redundant calls don't have to happen."

GDOS determines the fonts, metafiles, and device drivers to be used in graphics applications by searching for a text file on the main disk's root directory, called ASSIGN.SYS. In it, in ASCII form, are precisely-formatted lists of files which contain the necessary background data for a desktop publishing application. The trouble is, a user may have more than one graphics program, especially if she owns a hard disk drive. Timeworks' Desktop Publisher, EasyDraw, and DEGAS Elite are all quite different applications in purpose and in scope, but all three use GDOS. This means they must share the same ASSIGN.SYS file when GDOS is installed, whether or not you need all those printer fonts and drivers while painting a DEGAS diagram.

G+Plus solves that dilemma in this way: The Auto Folder portion of G+Plus "portrays" GDOS for the sake of applications which require it, while the accessory portion—always resident in memory—selects individual text files for each application, each acting in place of ASSIGN.SYS. This way, each application has its own font and driver list, and no program loads more data files into memory than it actually needs.

Charles Johnson explains how G+Plus, in a sense, beat the system: "There's a trap #1 intercept which watches for the p_exec call. When it gets the p_exec call, it looks through this list of file names which you build in the installation file editor [part of the G+Plus accesory], and it searches until it finds a match—or perhaps it doesn't. In any case, if it finds a match it will then attempt to load that ASSIGN file. It actually patches in before the point where the program runs, so it's completely transparent to the user. You see our little box on the screen telling you we're loading the right ASSIGN file."

Any interrupt routine which intercepts graphics calls to the VDI is going to slow down the system to a degree. G+Plus more than makes up for this decrease by overriding the portion of VDI which draws expanding rectangles, replacing it with faster, optimized code. Charles Johnson: "if you're moving a frame around, dragging a frame or box around on the page, you'll notice a real difference. With GDOS, it'll stick—it seems to jump from place to place instead of going smoothly as if you were dragging a box. With G+Plus, sizing a rubberbox, or other functions that re-

continued on page 444

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A Genius
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quire that sort of manipulation, should be just about as smooth as you could ask."

I'm not sure I've seen a Charles Johnson program, or one he's worked on, whichever consumed more than 25K of RAM. Just because Charles' work is characteristically small doesn't mean an extraordinary amount of care isn't put into it; in fact, Charles' strict adherence to optimization as a way of life is one of the reasons his utilities are so conservative. In developing G+Plus, Eidsvoog and Johnson had their share of headaches overcoming the "kludgyness" of GDOS—though they were expected headaches.

"Timeworks Desktop Publisher," relates Johnson, "does several things with GDOS that are a little bit nonstandard. It gets a little technical here: They intercept the trap #1 vector, and they actually handle all of the malloc calls that come through the system—these are the calls which allocate memory. They replace it with their own routine; in other words, when they run, they allocate all the available memory, and then parcel it out as these calls come through trap #1 instead of letting the system do it. I'm not sure what the reason behind this is, but I suspect it's because the system malloc routines have some bugs that come into play when you do more than a certain number of mallocs during a program.

"That gave us a few hard times; normally GDOS and G+Plus use malloc to allocate the memory for the fonts when they get loaded. There's no code that's specific to Timeworks Desktop Publisher in G+Plus; but we did want to make sure that we were compatible with every GDOS program."

One point of unexpected frustration, however, was in choosing a name for the program set. Charles is generally rather good—if not that, at least original—with names; besides "Catzeye" for his band, his previous one-man non-commercial software venture was entitled "Little Green Footballs Software." The origin of the name, he says, is too boring a story to tell here; by the way he said that, I suspect he may have been wrong. As for a good title for a replacement GDOS, Charles originally was planning on something befitting his more radical heritage:

"'The GDOS Liberation Front' was really a semi-joking title between John Eidsvoog and me before we were really even intending to make it a commercial product. We never really considered having that one go public. We did run into a lot of problems with the names we were choosing. We had 'GDOS-LF,' 'ADOS'—then we found out Atari had that one, and they got a cease-and-desist letter from a company that manufactures IBM software to stop them from using that name. Then we tried 'G-WIZ,' [which belonged to Cardco].

"We had to think up a completely new name, something which has no connection to the product at all. That's what we discovered about trademark law—a name like 'Kodak,' which has no relation to photographic film at all, is a very strong trademark; whereas 'Film' would be a lousy trademark."

G+Plus, being a GDOS substitute, has to conform to many of the restrictions of GDOS. Were Charles consulted about those restrictions back in '84 when the ST was being designed, what might he have changed in the system structure? "I think I probably would've really pushed for the outline font approach—in other words, have a set of vector descriptions that determine how each letter of a font is drawn. Then the scaling routines can take that information and draw it to the best resolution of each device, instead of having a really messy scheme like they have now where each font actually consists of multiple files. That's what's so confusing to the user; you have multiple files, each containing a font—except that they're all linked, but there's no obvious method of linking them. Even the file name is not necessarily indicative of what's in the font. The [font ID] data is actually inside the file—there's a font ID number, which has to be edited by the user, except that there's no way for him to easily do that unless he has enough knowledge to use a disk editor or one of the other programs.

"There's so little documentation about how to choose a font ID number or many other basic questions, that people have to make their own best choice about that kind of stuff. For instance, Neocept, when they put out their Camelot gothic font, chose a really high font ID number—32,000 or something—in hopes that it wouldn't interfere with any other font. But that actually caused problems, because some

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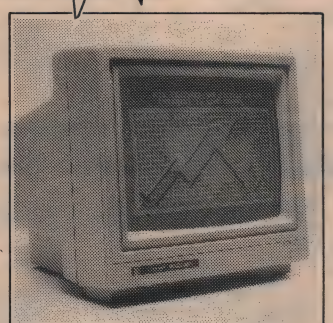

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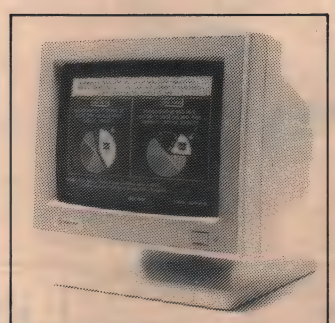

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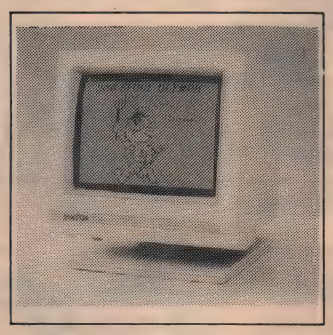

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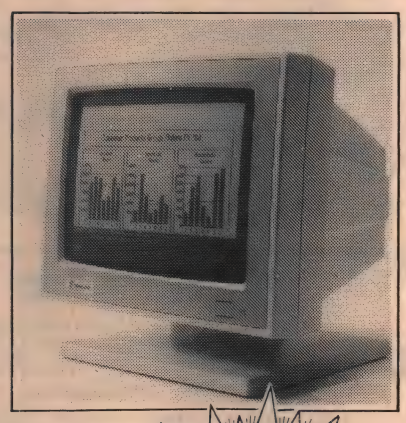

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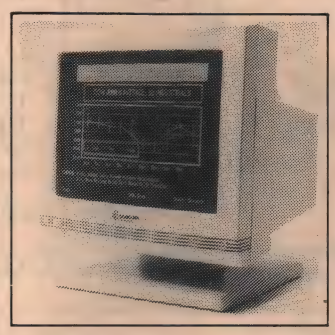

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programs were written so that they ignored the upper word, or the upper byte of the word value. They would only accept fonts numbered from 1 to 256. There's so many variables in this whole process, and a lot of it isn't documented, or at least certainly not documented to the user of an Atari computer who just gets his program, wants to run it, and wants to use the fonts, for heaven's sake. What should be so hard about that?

"That's what we were trying to address," Johnson continues, "when we took on the project of writing a new GDOS: to address some of the shortcomings as we saw them in the current scheme and still maintain enough compatibility that people would still be able to use their existing GDOS programs—which is a kind of a fine line to walk. It was a little frustrating at times."

G+Plus should be available at your ST software store, or by check for $34.95 from Codehead Software, P.O. Box 4336, North Hollywood, CA 91607. Credit card orders are being placed by Norm Weinress' ST store in North Hollywood, Logical Choice for Computing, at (800) 992-5232.

"He-ere I Come To Save The Da-ay!"

You might say Charles Johnson and the mouse were made for each other. In fact, the ST's graphic input device was one of the things which brought him into the realm of computing. In 1987, Charles wrote a public-domain accessory for *ST-Log* magazine which takes the standard arrow pointer and lets you make it into an animated two-color sprite. Called Mouse-ka-Mania, it contains both the mouse pointer-plotting interrupt scheme and the drawing utility, condensed and optimized into an assembly-language package about 14K in length. Charles' two-color mouse has made permanent residence in my system; I've been wanting him to program a little wheel for it to keep it company when I'm not around.

Perhaps it was Charles' luck with two-color mice which drove him to program Macro Mouse for Antic Software (no longer referred to as "The Catalog"). Consider it the graphic metaphorical equivalent of the batch file in the MSDOS realm. There, a series of multiple text-based commands may be inscribed beforehand and written to a single file, saved using the .BAT extension. The string of commands would be executed in sequence simply by referring to the name of the batch file.

A graphic operating environment has no straightforward way to represent multiple commands, being arbitrary mouse motions which can take place in any location depending upon the arrangement of your Desktop. Imagine a batch file which says, "Go up and to the right, and then drag something down roughly about here..." In a way, Macro Mouse provides the facility for precisely that. The memory-resident portion of the program set acts as a recorder of mouse movements, pixel-by-pixel, for playback at a later time. Since Charles is in the record business, one may surmise he's an expert on the subject of recording and playback.

With MACMOUSE.ACC installed, and the Desktop or running program appearing just as it will at the time of playback, the user presses the [ALT-Help] key combination—which would normally dump the screen contents to the printer. Instead, the GEM menu bar is replaced by the Macro Utilities menu from the memory-resident MACUTIL.PRG. The user selects which function key will represent the mouse movement macro (notice how Charles likes the letter "M?") and simply performs the mouse operation to be recorded, pressing [Ctrl-Shift-Alt] to end the recording. The user can hold down the [Alternate] key during the recording to "let in" only those mouse movements which will be meaningful. The recording also takes note of exactly how long the mouse is dormant—that way the mouse won't blindly search for the menu bar before the program is fully in RAM. No one needs blind mice running around in her computer.

When I tested Macro Mouse, I loaded "Dr. Doodle," an early drawing utility written for Digital Research that was programmed with only GEM's C-language bindings for graphics output. This way, if something went wrong, we couldn't blame the running program. I recorded a mouse macro which consisted entirely of winding the mouse around in a spiral. One can draw too fast for Dr. Doodle; as a result, what should normally look like tornadic activity ends up looking like pick-up sticks. Imagine my surprise when the macro, played back, resulted in the drawing of perfectly-rounded curves. The macro was somehow a more precise interpretation of my spiral than my manual drawing!

I immediately reported my discovery to Charles Johnson via Delphi, not unlike a physicist who's isolated a new

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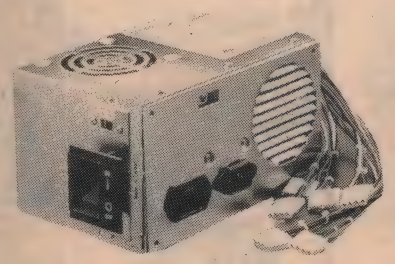

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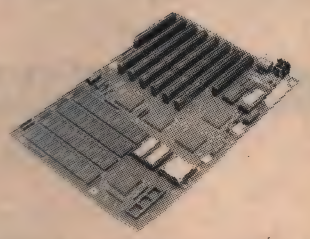

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flavor of quark. Even the mighty Mouse Man was stumped over what might be the precise cause of this phenomenon. He later, however, gave us a few clues: The playback routine, he says, resides in memory "at the lowest level of the system for that stuff, at the actual base interrupts that come into the system from the keyboard processor when you use the mouse. It's sitting there and getting [mouse events] before the system does, and just storing them in a buffer." What happens from the buffer on, states Charles, is a company secret.

Most memory-resident utilities are operated through the Desk menu, or with the aid of the [Alternate] key and a letter; but Macro Utilities is the first utility set I've seen which is activated using [Alt-Help]. The Help key is not your average key; the operating system is constantly scanning it for depression, as it were, checking to see if the user has ordered a print-screen. Charles' interrupt routine has to be faster than TOS.

Relates Johnson: "That was very tricky to arrange, because if you use any operating system calls to, for instance, print those lines of text at the top of the screen, you're in trouble. You have no idea what the system might be doing at that time. It might be in the middle of drawing its own text somewhere. If it's done that, and you've suddenly sent it another call, you've got in programmer's parlance, a re-entrant operating system call—which often ends in those little bomb icons.

"The actual interception of the screen dump routine itself is very simple. All you have to do is put the address of your routine in a low-memory variable that's documented. That's no big deal—replacing what's there with your own routines. Like I said, I cannot use any operating system functions to do anything within that [Alt-Help] utility. In other words, it all has to be done with direct-to-hardware calls. Somehow, through the course of several months of arduous programming, I managed to make it not use any undocumented hard addresses—so it should be compatible with any future versions of TOS."

There are two versions of Macro Utilities in the Macro Mouse package: one which allows only for recording, playback, and macro manipulation; the second contains function key access to ten of Charles' Famous Extras, including a full replacement for the ST's control panel accessory, a 32-bit four-function calculator with decimal/hexadecimal conversion, hooks to the screen dump routine (what you had in the first place) and a screen dump to disk in DEGAS format. All this consumes only the top single character line normally occupied by the menu bar, and consumes less RAM than the whole control panel accessory.

Since it uses the [Alt-Help] vector and no operating system calls, Macro Utilities can be run even from the Item Selector box; with the GEM standard fsel_input, M.U. includes a feature which changes the active drive without retyping the entire path on the directory line. If you're not fond of GEM's standard fsel_input (and I'm not), Charles threw in with Macro Mouse his replacement STart Selector box which, among other things, gives you a full byte count and time/date stamp on each file, and remembers the last input filepath in a self-updating radio button.

Macro Mouse is available through the standard retail channels, or through Antic Software, for $34.95.

Apres MIDI

Although one of the more technically-minded people I've come to know, Charles Johnson never lets the logical part of him interfere with the musical part of him. I suspect a hardware barrier separates the left and right sides of his brain, perhaps with the occasional memory-resident interrupt routine passing parameters between the two.

Charles discusses his two worlds, and the course he's plotted between them: "[Programming] has become another creative outlet for me, something that I find really rewarding. It's like puzzle-solving, but carried to the nth degree. To me it's similar to getting up on stage and playing a solo and feeling happy with it, as opposed to being critical about what you did—except that with programming, you get that second, that third, that hundredth chance to go back and make it right. You can always modify it. It's something like what happens to a musician in a recording studio, where you can continue to over-dub parts until they're perfect. You can keep honing your creative product until it is the best that you think it can be.

"[Programming] appeals to me; the whole process is very similar to creating music, and a lot less mathematical than people think. There's the whole [process] of building a nice, big, ordered structure, or an interrelated series of methods or networks that did not exist before you sat there and created it. It's very rewarding.

"My own personal outlook," relates Charles, "has always been that I've kept the two sides of my life separate up to now. In other words, my programming life has been what makes using the computer nice, not what makes using music with my computer nice. I don't know; I can see that [change] happening.

"[My studio] may not be as sophisticated as you think, actually. I'm mainly a guitar player. I've got a MIDI setup, but it's not my main focus. The two fields are starting to meet a lot these days, even for guitar players. With guitar players it's traditionally been more of a physical kind of a thing—move your fingers across the string and that makes a sound. But now, at least here in L.A., it's getting to be a lot more technologically oriented. When you walk into a studio to do a date for a producer, they expect you to have a telephone booth-sized rack full of MIDI-controllable gear. You've got to have digital delay, digital reverb. The guys who are working in L.A. right now have $20,000 tied up in their racks."

Would Charles ever be interested in the idea of MIDI—Musical Instrument Digital Interface—programming, making standard electronic musical instruments addressable by the ST? "I have some misgivings," he says, "about the whole idea of MIDI. MIDI itself is a somewhat limited form for the expression of music in digital terms. It has a certain resolution and it has certain capabilities, but it can't really go beyond those. That's always been a factor when I think about getting into the whole MIDI side of things. I think maybe, eventually, we're going to end up with a better format for relating music to computers. Individual expression—that's the thing that's really lacking in computer music right now. It's the kind of thing that you can't really measure. Until my dying day, I will maintain that there is a big difference between a real drummer playing the part and a drum machine playing that same part. There are nuances and differences, little fluxuations in timing that just cannot be captured by a computer in its most accurate form. You can break down a second into the smallest increment possible, but it may not be quite small enough. You can always go a little bit smaller. There's always little things that you're missing, that makes real music played by real musicians a little bit different from the same music played by a comptuer."

I generally spend a few hours composing a good closing paragraph, but Charles managed to conjure one up for me: "We're getting out on a thin philosophical limb here. It gives you a good lead-off, because you can say, 'The branch has snapped, and they tumbled into the philosophical abyss. Tune in next week for the further adventures of our hapless heroes.'"

Unfortunately the *Computer Shopper's* not a weekly; but you can find out what Charles Johnson and I are up to almost anytime by logging onto the Delphi telecomputing network, where Charles and I were partners in sysopping for the Atari SIG for over a year and a half. Charles can still be found there; his username is CFJ. Mine is DFSCOTT, generally to be found on C*SIX. We'll see you there. ●

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"STICK" and "STRIG" functions. There's a trick to using these two: Port 0 is generally reserved for the mouse; so hooking a joystick to that port would result in almost meaningless information being fed to the Intelligent Keyboard, the IKBD. The fire button would work, but little else. GfA 3 makes Port 0 joystick-ready with the STICK 0 command. Now we can have two-player GfA joystick games without having to write an assembly-language routine to reconfigure the entire IKBD.

The series of programs written for and around GfA Basic 2 contained a fairly nice accessory packaged called GfA Companion. This included a utility which allowed the programmer to construct complex dialog boxes with text input fields and radio buttons, for use in her GfA programs. Although it was an adequate substitute for a real resource file editor, GfA 3 no longer requires the use of Companion; instead, the disk in the new package contains the second and most recent version of Atari's Resource Construction Set. The RCS allows the programmer to construct the graphic background and menu bars for GEM programs, without having to key in each number manually.

RCS2 creates files saved under the *.RSC extender (you've probably seen those resource files on major program disks) in which the data is retrieved in an hierarchical format. For example, picture in your mind a custom dialog box within which there are several rectangles containing text and text input fields. Within those separate rectangles are radio buttons, which contain user selections like "OK" and "Cancel." The way RCS2 organizes things, the radio buttons are "children" of the sub-rectangle, and the main dialog box is the "parent" of the sub-rectangle. This family hierarchy—which can stretch for several generations depending on the depth of the program—is referred to as an "object tree;" and is one of the most effective ways of chaining simple graphic objects. With RCS2, the programmer merely draws the hierarchy; the resource editor determines the roots, as it were.

The standard AES bindings for accessing the saved resource files are all keywords in GfA Basic 3. This will be especially important once the Compiler is made available. Previously, the extension bindings in the GfA Companion package were the only ways a GfA programmer could access true resource files; though once the source code was compiled, the redundant code in the bindings resulted in a non-optimized program. With the bindings now built-in, the new Compiler may produce tighter code, for programs of marketable quality. Sources at MichTron say the Compiler for GfA 3 should be available before Christmas.

There are changes to the program editor which are also notable. Besides the GfA-specific menu bar which regular users will, for the most part, be familiar with, GfA 3 includes a GEM menu bar for program input/output control. "Procedures"—the GfA term for subroutines—may be listed to the screen in abbreviated form, so that only the header shows until the title is clicked on with the mouse. The familiar command prompt is still present for conventional program control. The interpreter package, complete with a 646-page legible reference manual, sells for $99.95.

But Wait—Doesn't That Keyword Belong In Regent Base?

Just when you thought it was safe to go back into representational algebra, the relational concepts of SQL make waves in the ocean of keywords that GfA Basic has become. Regent Software's Frank Cohen—whose name should be familiar to regular *Computer Shopper* readers by now—has released his SQL Database Add-On for GfA Basic. This is an extension program which adds E.F. Codd's standard SQL commands—the main four being SELECT, CREATE, DELETE, and UPDATE—to GfA Version 2 (testing for Version 3 remains to be done).

A BASIC-language structure by itself only allows the programmer to access arrays of data by individual elements. If you've DIMensioned an array called names, for instance, you can only place a call to "names(3)" or some other integer subscript. With Regent's SQL extension installed, a set of data can be CREATEd using that keyword, and referred to collectively as "names." This way, one can ask GfA to extract just those names which begin with "F" in this manner:

```
SELECT item FROM names WHERE item ^ "F*";
```

continued on page 450

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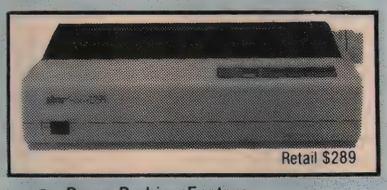
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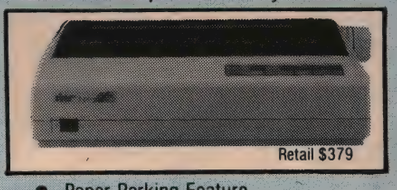
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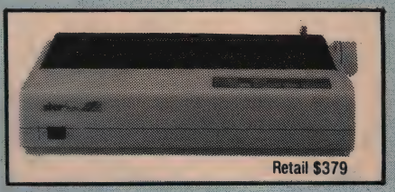
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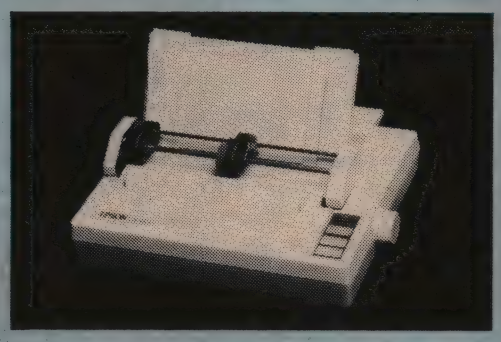

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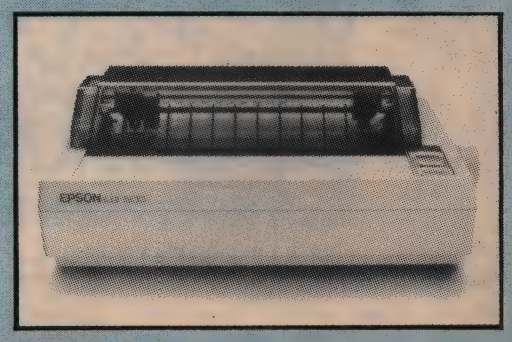

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ST Product News continued from page 447

Notice there is no noticeable difference between the SQL Add-On and the syntax in Regent Base 2, which was discussed in these pages last month. Of course, the programmer would have to find her own ways of distinguishing GfA variables from SQL sets; but once a copy of the Add-On is made available to us, we'll figure out the best way of doing so, and report it to you here.

The SQL Database Add-On is available directly from Regent Software, for a $30 check ($33 for Canadian orders, $35 from outside the mainland U.S.) addressed to Regent Software, P.O. Box 14628, Long Beach, CA 90803.

Frank is currently working on the SQL Database Add-On for LDW BASIC, which would work with Version 2 of that compiler. LDW 2 adds numerous keywords to the standard ST BASIC set (though not as many as GfA 3). Logical Design Works, the manufacturer of that product, has made a review copy available to *Computer Shopper*; but we've been waiting for the revision to GfA in order to make a fairer comparison between the two. Initial tests have indeed shown compiled LDW 2 code to be faster than compiled GfA 2 code with particular benchmarks. We anxiously await the compiler for GfA 3 and the SQL Add-On for LDW 2 so that we can compare the two BASICs on equal terms.

No Longer Just Talk

Two months ago, we previewed Quantum Microsystem's ST-Talk Professional by John S. DeMar, in its near-to-final form. John and I are both happy to say that the product is finally available, in Version 2.0c. Although the program doesn't require one megabyte of RAM, in order to use its multitude of capture buffers or to have room for even a small RAMdisk, it would be nice to have the full meg on board. The price is $29.95 at ST software outlets, or $10 when mailed in check form to QMI along with an ST-Talk 1 original disk. QMI's address is P.O. Box 179, Liverpool, NY 13088.

When you purchase the product, be sure to send in your warranty registration card, which entitles you to Version 2.0d once it becomes available. The revision will contain a few enhancements to the AutoPilot language, as well as enabling the background up/down-loading feature. The user should be able then to start a file transfer, and then go edit a capture buffer or even run a separate program. These enhancements are only available to registered users.

AutoPilot, as was stated in our previous article, is a terminal control language with many of the features of a high-level programming language. The interpreter for AutoPilot is built into ST-Talk Pro.

Listing 1 (page 273) shows an automated log-on file for Delphi through Telenet which I wrote for AutoPilot, as an example of the general syntax used throughout the language. Variable assignments are made in the common fashion using the equal "=" sign. A variable name doesn't necessarily denote whether its contents are numeric or an alphanumeric string; but once you make an assignment of one type to a variable, you cannot later reassign that same variable a value of the other type. Once a string, always a string. The wave line "~" character denotes a carriage return, whether sent or received over the modem. Any variable whose contents were rendered unto it by the modem is considered to be a string, not a number.

Subroutine procedures are ruled out from the rest of the program using the "@" character. Regular line labels are set off from the rest of the program using the underline "_" character. In order for a subroutine to be recognized by the interpreter, its contents must be located above any line which invokes that subroutine. Thus my "trouble" routine falls at the beginning of the program, far above any procedure calls made to it. You don't need to use a "gosub" keyword or anything of that sort to call a subroutine; just invoke it with its name only.

The "alert" function demonstrates John DeMar's background with the C language; the call is placed like in C, as if the entire function call itself were a numeric value, which may then be assigned to the variable "what" (whose name I chose arbitrarily). "Alert" brings up a dialog box which contains an exclamation mark icon a la Mac (icon #1), whatever text falls in the next set of square brackets, and up to three radio buttons separated by the vertical line "|" character. If the user chooses the "Continue" button, then the function returns a value of 1 to the variable "what;" other buttons would return 2 and 3, respectively.

Throughout this listing, I've included keywords which, to the interpreter, are totally meaningless. In other words, some words have been added to the

continued on page 451

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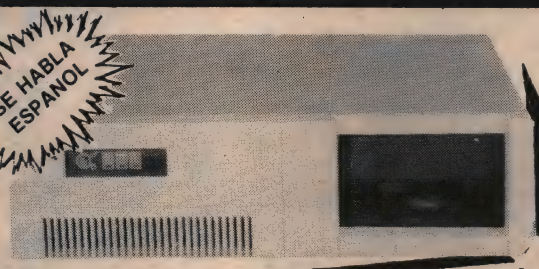

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Hacking The ST
continued from page 274

As it stands now, the most common baud rate for BBSs is 1200 baud, and almost all provide 300 baud support. 2400 baud is available on most larger BBSs and 9600 baud is starting to show up on state of the art BBSs.

The second parameter we set is the number of data bits. 8 is by far the most common, but a few systems that cater to certain brands of home computers use 7 data bits. (Apple only BBSs and some 8 bit Atari BBSs still use 7 bits.)

The third item we need to set up is the number of stop bits. Almost all of the BBSs you are likely to call run one stop bit, but I have seen cases where 2 stop bits were specified. (2 stop bits were common in the days of the mechanical terminal, but they were almost always associated with baud rates of 300 or less.)

The forth item is the parity. Most mainstream BBSs use no parity (to facilitate file transfers). There are a few systems where you will need to use even or odd parity.

There are also several additional items that have to be set correctly, but there is almost universal agreement on the settings so they don't worry the average home computer user. (Use of 1 stop bit on BBSs today is virtually universal, so our package will assume 1 stop bit.)

The first "default" item is the duplex, half or full. I only know of one major service that uses half duplex, and that isn't true half duplex (they don't use a turn around character) so for more than 90 percent of your use you'll most likely need full duplex.

The other "default" item is the mode. On the lower speed settings modems use tone pairs when running full duplex. When you call a BBS in full duplex, your modem uses a pair of tones, one for a high condition (logical 1) and one for a low condition. (logical 0). The modem that is hooked to your modem (via the phone lines) also uses a pair of tones, but it uses a different pair of tones.

If we call the first pair of tones A and B, and the second pair of tones 1 and 2, then your modem can send tone A or tone B, while it can receive tones 1 or 2. The modem hooked to the BBS must send tones 1 or 2, and it receives tones A or B.

If your modem is sending tones A and B, it is said to be in originate mode. The modem hooked to the BBS using tones 1 and 2 is said to be in answer mode. Modern smart modems switch modes automatically, so smart modem owners don't have to worry about the modem mode.

Since almost all BBSs are set up for answer mode, unless you have a dumb

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ST Product News
continued from page 450

AutoPilot language simply to make the program lines read easier. For example, take the line signal = wait for 30 seconds for "TERMINAL = ." The keyword here is "wait," which starts a clock running for the given number of seconds until the designated string of characters comes over the modem—in this case, Telenet's "TERMINAL = " prompt. The words "for" and "seconds" were added simply for clarity—AutoPilot knows to skip over precisely those words. I could've written instead signal = wait 30 "TERMINAL = " with precisely the same results. Note again that the function syntax is like C, not BASIC—the function is stated as if it were a decided value that could be given to a variable "signal."

In order for you to use this program on your own copy of ST-Talk Pro, of course you would need to write your own username and password into the variable declared at the top of the listing. The "printm" command sends a string value to the modem, whether it be written outright or represented by a variable. The "print" command by comparison (not shown in the listing) would print a string directly to the terminal screen only—the modem would never see it. By contrast again, the "printd" command sends a string to the device or open sequential-access file whose number follows the command itself. Along with "inputd," a function or routine can be tested on screen—without having to log onto anything first—to make sure that it works.

We'll be presenting more AutoPilot routines, both here and on C*SIX's Telecommunications database on Delphi. In the meantime, don't forget to check in with us on the *Computer Shopper* Information eXchange to discuss—even debate—important computing issues. Remember, Delphi is accessible through both GTE Telenet and McDonnell-Douglass Tymnet services. We'll see you there. ●

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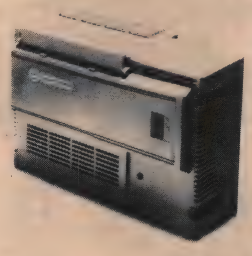

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Hacking The ST

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modem and are calling a friend that also has a dumb modem you don't have to worry about the mode either. If you are using a dumb modem and a friend is calling you, you will need to switch your modem to the answer mode. (Dumb modems have to be switched manually by the owner, so we don't worry about originate/answer mode in our program.)

This isn't intended to be a complete run down on serial communications, rather I just wanted to point out the items the average computer user needs to specify in order to connect up with a modern BBS. There are other items that the writer of communications programs needs to worry about.

Now let's start looking at the kind of things we need to provide for in our communications program. In addition to baud rate, data bits and parity (which can vary from BBS to BBS) there are several things we need to know about the modem. Once set, these items are not likely to vary since most folks only have one modem.

The first and most important thing we need to know about the modem is whether it is a smart modem or not. Smart modems can be commanded to dial the phone, while a dumb modem requires the operator to dial the phone.

Assuming we have a smart modem, the next thing we are concerned about is the speed we can send commands to the modem. This is not the same as the baud rate. Most modems can accept characters one right after another, but there are a few modems out there that require a little bit of a delay between characters when they are receiving a command.

As the writer of a communications program you have two obvious choices here. You can simply add a slight delay between characters in a modem command for all modems, and not bother the operator with this little detail, or you can allow the delay to be added only for those modems that require it.

The next thing we need to know is the string the modem sends when the number it called is busy. There are two different strings in common use. The first string is BUSY, while the second string is NO CONNECT. Most smart modems can send either of these strings depending on the initialization string sent to the modem.

You might well be wondering why we need to know this. Well, people have come to expect modem programs to have features like auto redial and auto logon, so the program needs to know when the modem connects to the BBS and when the number it's calling is busy.

As a matter of fact, auto redial has become so desirable that several modems now auto redial all by themselves. This can present a problem because these auto redial modems will stop redialing if they receive a character while they are performing a redial.

If the user has a regular smart modem, then the program needs to tell the modem to dial the number again if it gets a busy signal, but the second kind of modem can't receive any command or it will stop dialing.

The program needs to be aware of the kind of modem that is out there so that it will be able to take the correct action for a busy signal.

The time has come to discuss the initialization string. The initialization string is used to set the internal modes of the modem. This string, sent to the modem right after power up, determines whether BUSY or NO CONNECT is sent for a busy signal, how long the modem waits for a carrier before it sends NO CONNECT, whether it uses pulse dial or tone dial, etc.

The internal modes supported vary widely from modem to modem. The initialization string serves to set up the defaults for the modem's operation. If the defaults built into the modem are acceptable, then the initialization string basically sets the baud rate the modem runs at.

The last item we'll worry about is the dialing prefix. The dialing prefix is a short string that is transmitted as the leading part of a dialing command. After the dialing prefix comes the actual phone number itself. The dialing prefix is used to command the modem to dial the number that is embedded in the command.

The two strings (initialization and dialing prefix) vary from modem to modem. Even with the same modem, two different users may well use different strings because they want to use different features of the modem.

Armed with a very brief overview of smart modem operation, let's take a look at how we would like the program to operate.

Dialing into a BBS should as easy as we can make it, so it would be helpful if we can write the program so that setup is done once, and it only takes one or two keystrokes to actually call a BBS.

The operation I've decided on is a simple menu. One of the function keys will be used to pull up the phone number menu, and then you just enter the index of the BBS you want to call. The program takes it from there. (Using the mouse and the regular pull-down menus is a mod that will be added later, GEM burns up a lot of CPU time so for now we use simple text menus, which is keeping with the text only nature of most BBSs.)

The menu should show the BBS name and the phone number. Other information needed (such as parity and baud rate) should not be shown at the time of operator selection.

Auto redial is taken care of by watching the characters that come from the modem after sending the dialing command. We then determine if the call went through. If a call does not go through, we wait a short period of time (20 seconds) and then send the dialing command again.

We need a way for the operator to break out of the redial loop, so we will use the undo key to set a flag that terminates the dialing. This doesn't affect the programs here, but it is an important item to remember, you need to pro-

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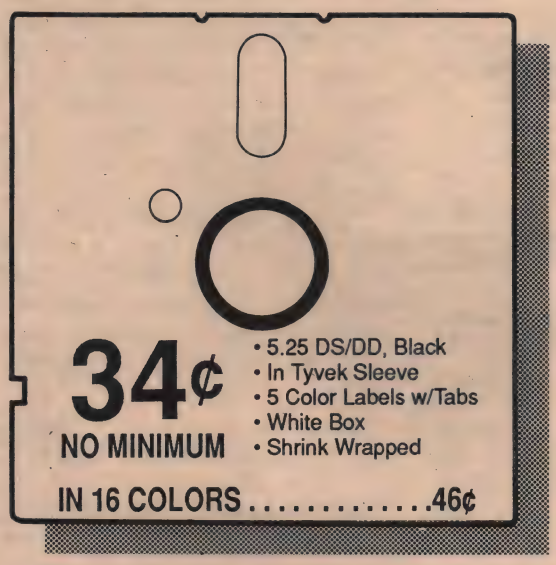

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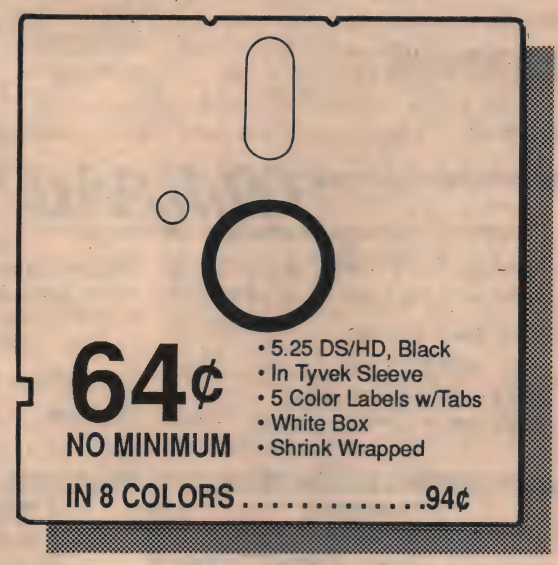

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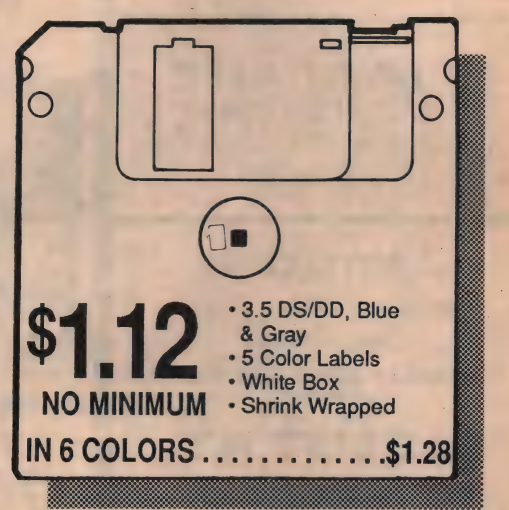

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Hacking The ST
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vide the operator with a way to back out of selections.

All of the phone number setup will be performed in an offline program, and we will just read in a data file for use by the main program. This means that the setup program will be editing a stand-alone data file.

For each BBS we need the name and phone number (which are the only two fields displayed by the modem program itself) the baud rate, parity, number of data bits and whatever information is needed to log onto the BBS. Since Logon is not required in all cases (sometimes you may want to just transfer data from one machine to another) we also add a field to specify the action required when the number is selected.

We will go the simplest route possible for auto logon, every time the BBS pauses, we will assume that it is waiting for input from us and we will send it another string. So in order to support auto logon we will need some strings, (10 seems to be more than enough) an indication of how many strings are actually required and something that indicates how long a pause is.

This is enough information to get us started on the offline program that sets up the phone directory. We allow 24 phone entries, saving the last line on the display for operator interaction.

We need routines to read in the phone directory, and to save the modified phone directory to disk for use by the program. We also need routines to select which directory entry we are working on and to select a field within an entry. Last but not least, we need a routine to edit each field of the phone directory.

Our phone editor then reads in the complete phone directory, asks the operator which entry needs to be edited, then enters a loop where it asks for the field to edit and then calls the routine to get a new value for that field. After all the entries have been edited, the new data is saved to the disk file. (This is an example of a classic top down design.)

Hopefully by now you have developed an ability to read cleanly written C code so for this issue I will dispense with the blow by blow run down on the software. Besides, once you know what the programs are up to, the code is very straightforward.

Listing 1 (page 274) is the configuration program. It gets the information about the modem that is not subject to change, and gets default values for baud rate, parity, and data bits. The information is stored in a configuration file that is read in by the program when it starts.

Listing 2 (page 456) is the phone directory editing program. It allows the operator to edit the fields of a phone directory entry. There is a small routine for each field, and two outer loops to allow selection of the entry and the field.

I hope you have been picking up a few tips on using the ST with C, and I urge you to hang in there. We're coming up to the meat of the program and it will get a little hairy, but you'll be rewarded with a good understanding of many of the ST system calls, and a communications program that will serve as a very nice test bed for your own experiments. Until next time, keep 'em flying. ●

Hacking The ST Listing 1
continued from page 274

```
void setbits()

/* this function sets number of data bits based on operator input */

{
char ans;

clear();
printf("Most systems use 8 data bits, but a few (such as Apple) use 7.\n");
printf("Will you be using mainly 8 data bits? (y/n) ");
fflush(stdout);

FOREVER
    {
    ans = Bconin(2);
    if ((ans == 'y') || (ans == 'Y'))
        {
        bits = '8';
        printf("Yes\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if ((ans == 'n') || (ans == 'N'))
        {
        bits = '7';
```

continued on page 455

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Hacking The ST Listing 1 continued from page 454

```
        printf("No\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setdly()

/* this function sets the delay flag based on operator input */

{
char ans;

clear();
printf("Most modems accept commands at full speed,\n");
printf("but the USRobotics modems will not.\n");
printf("Do you need command delay? (y/n) ");
fflush(stdout);
FOREVER
    {
    ans = Bconin(2);
    if ((ans == 'y') || (ans == 'Y'))
        {
        dflag = 'D';
        printf("Yes\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if ((ans == 'n') || (ans == 'N'))
        {
        dflag = 'N';
        printf("No\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setbsy()

/* this function sets the busy flag based on operator input */

{
char ans;

clear();
printf("Most Hayes compatible modems send NO CONNECT\n");
printf("when they dial a busy number unless you have\n");
printf("sent an X3 or X4 command.\n");
printf("The Volksmodem 12, and Hayes 300/1200 with the\n");
printf("X3 or X4 commands send BUSY when they dial\n");
printf("a busy number.\n");
printf("Does your modem send NO CONNECT for busy numbers? (y/n) ");
fflush(stdout);
FOREVER
    {
    ans = Bconin(2);
    if ((ans == 'y') || (ans == 'Y'))
        {
        bflag = 'N';
        printf("Yes\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if ((ans == 'n') || (ans == 'N'))
        {
        bflag = 'B';
        printf("No\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setparity()

/* this function sets the parity character based on operator input */

{
char ans;
clear();
printf("Most computer systems will use no parity.\n");
printf("Parity settings are:\n");
printf("\n\n");
printf("1.    No parity\n");
printf("2.    Even parity\n");
printf("3.    Odd parity\n");
printf("\n\n\n");
printf("Please enter the number that best describes\n");
printf("the requirements of the system you talk to\n");
printf("the most.  If you don't know the parity\n");
printf("requirements, enter 1. ");
fflush(stdout);
FOREVER
    {
    ans = Bconin(2);
    if (ans == '1')
        {
        parity = 'N';
        printf("No parity\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '2')
        {
        parity = 'E';
        printf("Even parity\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '3')
        {
        parity = 'O';
        printf("Odd parity\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setsmart()

/* this function sets the smart flag based on operator input */

{
char ans;
clear();
printf("Do you have a Hayes compatible smart modem? (y/n) ");
fflush(stdout);

FOREVER
    {
    ans = Bconin(2);
    if ((ans == 'y') || (ans == 'Y'))
        {
        smart = 'S';
        printf("Yes\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if ((ans == 'n') || (ans == 'N'))
        {
        smart = 'D';
        printf("No\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setdial()
```

continued on page 456

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Hacking The ST Listing 1 continued from page 455

```
 * this function sets auto-redial flag based on operator input */

{
char ans;

clear();
printf("Some modems, such as the ADC will redial all by themselves.\n");
printf("Does your modem auto-redial without any command? (y/n) ");
fflush(stdout);

FOREVER
    {
    ans = Bconin(2);
    if ((ans == 'y') || (ans == 'Y'))
        {
        dial = 'R';
        printf("Yes\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if ((ans == 'n') || (ans == 'N'))
        {
        dial = 'N';
        printf("No\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}

void getistr()
/* this function gets an initialization string from the operator */
{
clear();
printf("SIDEBAND will send an initialization string\n");
printf("to your modem during program initialization.\n");
printf("A good string for Hayes compatible modems is\n");
printf("AT with a return.\n");
printf("The string may be up to 20 characters long.\n");
printf("You may insert a return in the string at\n");
printf("any location by pressing the Esc key\n");
printf("Initialization string: ");
fflush(stdout);
getans(istr,20);
}
void getdstr()

/* this function gets a dialing prefix string from the operator */

{
clear();
printf("Most Hayes compatible modems use a dialing\n");
printf("prefix of ATDP for pulse dialing and ATDT\n");
printf("for tone dialing.  Look in your modem manual\n");
printf("for the string used by your modem.\n");
printf("The string may be up to 20 characters long.\n");
printf("You may insert a return in the string at\n");
printf("any location by pressing the Esc key\n");
printf("Dialing prefix string: ");
fflush(stdout);
getans(dstr,20);
}
```

Listing 2—edit.c

```
#include (stdio.h)
#include (osbind.h)
#include (errno.h)
#include "ssb.h"
#include "xesup.h"
#include "phone.h"
/* some routines used */
void newphone();
void do_phone();
void show_num();
void shocur();
void newnum();
void setdly();
void store();
void newd();
void setbaud();
void setbits();
void setparity();
void setstr();
void setnme();
void setnum();
void shomac();
void setdstat();

/* globals */
char pbuf[6192];                /* buffer for 24 directory entries */
int done;                       /* edit completion flag            */
char pname[64];                 /* phone file path name            */
char dstr[21];                  /* dummy macro string              */
char dphone[32];                /* dummy phone number              */
char dname[11];                 /* dummy BBS name                  */
struct d_entry p_dir[24],*q;    /* phone directory                 */
main()
{
newphone();
done = FALSE;
FOREVER
    {
    do_phone();
    if (done) break;
    }
store();
}
int getnum()
/* this guy gets an integer from the user */
{
char nbf[10];
```

continued on page 457

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Hacking The ST Listing 2 continued from page 456

```
int val;

getans(nbf,5);
val = atoi(nbf);
return(val);
}
void newphone()

/* this function reads in the phone directory */
/* it is stored in an array in memory         */
{
int y;                  /* loop counter                  */
int i;                  /* loop counter                  */
int x;                  /* directory loop counter        */
char *current;          /* pointer to phone entry buffer */
int phand;              /* file handle of phone file     */
long stat;              /* status of file operations     */

/* here is where we read in the phone directory */

/* try to open the phone file       */
stat = Fopen(PNAME,0);
if (stat < 0L)
    {
    printf("Fopen returned: %ld\n",stat);
    printf("Cannot open phone number file: %s\n",PNAME);
    printf("Have you moved PHONE.DAT or the SUPPORT folder?\n");
    fflush(stdout);
    waitkey();
    exit(1);            /* go back, can't do anything now   */
    }
else
    {
    phand = (int) stat;                     /* gen up a file handle       */
    stat = Fread(phand,6192L,pbuf);         /* try to read in data        */
    if (stat != 6192L)                      /* if we didn't get all of it */
        {
        printf("Fread returned: %ld\n",stat);
        printf("Cannot read phone number file: %s\n",PNAME);
        printf("phone.dat is damaged.\n");
        fflush(stdout);
        waitkey();                          /* go back, can't do anything */
        exit(1);
        }
    }
/* now we need to close the phone file */
Fclose(phand);                          /* try to close the file */

/* now that all the data is in, set up the directory */
current = pbuf;                         /* point to start of array */
for (x = 0; x < 24; x++)                /* read in 24 phone entries */
    {
    p_dir[x].num = *current++;
    p_dir[x].dly = *current++;
    p_dir[x].estat = *current++;
    p_dir[x].baud = *current++;
    p_dir[x].bits = *current++;
    p_dir[x].parity = *current++;
    for (y = 0;y < 10;y++)
        for (i = 0;i < 21;i++)
            p_dir[x].mac[y][i] = *current++;
    strncpy(p_dir[x].bname,current,10);
    current += 10;
    strncpy(p_dir[x].phone,current,32);
    current += 32;
    }
}
void do_phone()

/* this function handles all interfacing with the phone directory */

{
int i;
int opt;

/* clear the screen */
clear();

/* display the phone directory */
for (i = 0; i < 24; i++)
    show_num(i);

/* find out which entry we need to edit */
opt = whatnum();
printf("\n");
fflush(stdout);
if (opt == 0)
    {
    done = TRUE;
    return;
    }
newd(opt);
}
void show_num(num)
int num;

/* this function will display a phone entry */
{
char nbuf[50];

/* first we print the selection number */
printf("%02d",(num + 1));
printf("..");
fflush(stdout);
strcpy(nbuf,p_dir[num].bname);
nbuf[10] = '\0';
printf("%s....",nbuf);
printf("%s",p_dir[num].phone);
printf("\n");
fflush(stdout);
}
int whatnum()
/* this function gets the number to edit */
{
int num;
```

continued on page 458

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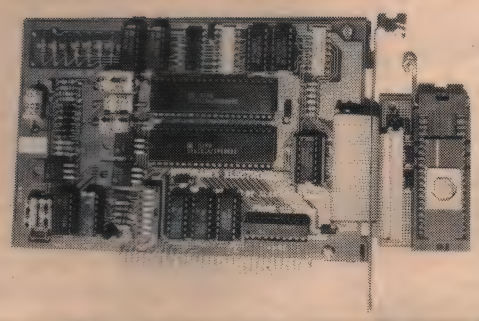

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Hacking The ST Listing 2 continued from page 457

```
drain();
printf("Entry to edit?  (0 to exit EDIT.TOS) ");
fflush(stdout);
num = getnum();
if ((num < 1) || (num > 24)) num = 0;
return(num);
}
int whatfld()

/* this function gets the field to edit */
{
int num;

drain();
printf("Field to edit?  (0 to return) ");
fflush(stdout);
num = getnum();
if ((num < 1) || (num > 18)) num = 0;
return(num);
}
void newd(x)

int x;

/* this function allows you to edit the info in a current directory entry */
{
int sel;

x--;
FOREVER
    {
    shocur(x);
    sel = whatfld();
    /* get the info */
    if (sel < 1) break;
    if (sel == 1) setbaud(x);
    if (sel == 2) setbits(x);
    if (sel == 3) setparity(x);
    if (sel == 4) setnme(x);
    if (sel == 5) setnum(x);
    if ((sel > 5) && (sel < 16)) setstr(x,(sel - 6));
    if (sel == 16) setdstat(x);
    if (sel == 17) newnum(x);
    if (sel == 18) setdly(x);
    }
}
void shocur(x)

int x;

/* this function displays the current contents of a directory entry */
{
char bd;
char bt;
char pt;
char *p;
int numb;
int dlly;
int y;
clear();
bd = p_dir[x].baud;
bt = p_dir[x].bits;
pt = p_dir[x].parity;
numb = (int) p_dir[x].num;
dlly = (int) p_dir[x].dly;
numb &= 0x00ff;
dlly &= 0x00ff;

printf("01: BAUD --> ");
if (bd == '3') printf("300\n");
if (bd == '1') printf("1200\n");
if (bd == '2') printf("2400\n");
if (bd == '4') printf("4800\n");
if (bd == '9') printf("9600\n");
fflush(stdout);

printf("02: BITS --> ");
printf("%c",bt);
printf("\n");
fflush(stdout);
printf("03: PARITY --> ");
if (pt == 'N') printf("None\n");
if (pt == 'O') printf("Odd\n");
if (pt == 'E') printf("Even\n");
fflush(stdout);
printf("04: BOARD NAME --> ");
fflush(stdout);
p = p_dir[x].bname;
for (y = 0;y < 10;y++)
    {
    Bconout(2,*p);
    p++;
    }
printf("\n");
fflush(stdout);
printf("05: PHONE NUMBER --> ");
printf("%s\n",p_dir[x].phone);
fflush(stdout);
for (y = 0;y < 10;y++)
    {
    printf("%02d: MACRO %02d --> ",(y + 6),(y + 1));
    fflush(stdout);
    shomac(x,y);
    printf("\n");
    fflush(stdout);
    }
/* here is where we add the status display */
printf("16: ");
if (p_dir[x].estat == 'A') printf("Logon\n");
if (p_dir[x].estat == 'D') printf("Dial\n");
if (p_dir[x].estat == 'S') printf("Set\n");
fflush(stdout);
printf("17: %d strings\n",numb);
printf("18: %d tenths of a second.\n",dlly);
fflush(stdout);
}
void store()
/* this function saves the new phone directory on disk */
{
int fhand;
int x;
char *p;
long num;
fhand = (int) Fcreate(PNAME,0);
if (fhand < 0)
    {
    printf("Fcreate returned: %d\n",fhand);
    printf("Unable to create phone file.\n");
    printf("The disk may be full or the SUPPORT ");
    printf("folder may be missing.\n");
    fflush(stdout);
    waitkey();
    exit(1);
    }
for (x = 0;x < 24;x++)
    {
    q = &p_dir[x];
    p = (char*) q;
    num = Fwrite(fhand,258L,p);
    if (num != 258L)
        {
        printf("Fwrite returned: %ld\n",num);
        printf("Unable to write to the phone file.\n");
        printf("The disk may be full, missing or damaged.\n");
        fflush(stdout);
        waitkey();
        exit(1);
        }
    }
Fclose(fhand);
}
void setbaud(x)
int x;
/* this function sets the baud rate character based on operator input */
{
char ans;
char bd;
bd = p_dir[x].baud;

clear();
printf("The current baud rate is ");
if (bd == '3') printf("300\n");
if (bd == '1') printf("1200\n");
if (bd == '2') printf("2400\n");
if (bd == '4') printf("4800\n");
if (bd == '9') printf("9600\n");
printf("\n\n\n");
printf("SIDEBAND baud rates are:\n");
printf("\n\n");
printf("1.    300 baud\n");
printf("2.    1200 baud\n");
printf("3.    2400 baud\n");
printf("4.    4800 baud\n");
printf("5.    9600 baud\n");
printf("\nPlease enter the number for this board: ");
fflush(stdout);
drain();
FOREVER
    {
    ans = Bconin(2);
    if (ans == '1')
        {
        p_dir[x].baud = '3';
        printf("300 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '2')
        {
        p_dir[x].baud = '1';
        printf("1200 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '3')
        {
        p_dir[x].baud = '2';
        printf("2400 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '4')
        {
        p_dir[x].baud = '4';
        printf("4800 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '5')
        {
        p_dir[x].baud = '9';
        printf("9600 baud\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setbits(x)
int x;
/* this function sets the bits character based on operator input */
{
char ans;
char bt;

clear();
bt = p_dir[x].bits;
printf("The current setting is %c data bits.\n\n\n",bt);
printf("Will you be using 8 data bits? ");
fflush(stdout);
drain();
FOREVER
    {
    ans = Bconin(2);
    if ((ans == 'y') || (ans == 'Y'))
        {
        p_dir[x].bits = '8';
        printf("Yes\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if ((ans == 'n') || (ans == 'N'))
        {
```

continued on page 460

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LODERUNNER	50803	$10
MEAN 18	54201	$25
MIGHT & MAGIC BOOK I	50103	$30
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SEARCH & DESTROY	50819	$14

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THE PRINT SHOP COMPANION	50809	$29
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TYPE	50811	$20
TYPING TUTOR IV	53103	$29
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ENABLE 2.0	53501	$379
LOTUS 1-2-3	51901	CALL
MS WORKS STARTER PACK	52211	$160
PC EXCEL (MICROSOFT)	52204	$309
PFS FIRST CHOICE	53206	$89
PFS PROF PLAN	53204	$60
QUATTRO (BRLD)	50601	$155

LANGUAGES/COMPILERS	PART #	
AT LIBERTY	54106	$118
CONCRNT PC DOS XM (3 USER)	51001	$229
MICROSOFT QUICK BASIC 4	52207	$68
TURBO BASIC DATABASE TOOL BOX	50619	$65
TURBO BASIC EDITOR TOOL BOX	50607	$65
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GEM DESKTOP V3	51002	$29
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NORTON UTILITY ADVANCED	54302	$79
NORTON UTILITY 4.0	54301	$50
NOTE IT PLUS	53201	$49
NOTEWORTHY	51502	$44
PC TOOLS DELUXE	54602	$40
PC WORKS (MICROSOFT)	52208	$140
REFEREE	52701	$49
SIDEKICK	50604	$53
SIDEKICK PLUS	50605	$125
SIDEWAYS 3.1	51503	$39
SMARTMOVE (PERSOFT)	52703	$99
SOFTBYTES	52301	$32
SOFTWARE CAROUSEL	54105	$49
SUPERKEY 1.5 (BRLND)	50617	$55
TORNADO NOTES 1.73	55701	$70
WINDOWS 286 (MICROSOFT) V2.1	52209	$68
WINDOWS 386 (MICROSOFT) V2.0	52206	$129

WORD PROCESSING	PART #	
BANK ST WRITER PLUS, 3.5"	50851	$49
BANK STREET WRITER PLUS	50801	$49
DAC EASY WORD 2	50905	$29
FOUR WORD (123 WORD PROC)	53701	$60
FRIENDLY WRITER	51401	$31
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PEACHTEXT 5000	55002	$129
PFS PROF WRITE V 2.0	53207	$109
RIGHTWRITER	55601	$51
SPRINT (BORLAND)	50606	$119
TURBO LIGHTNING	50612	$62
VOLKSWRITER DELUXE PLUS	51801	$69
WEBSTER NEW WORLD WRITER	53104	$55
WEBSTER ON LINE THESAURUS	53106	$39
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WEBSTER NEW WORLD WRITER	53104	$52
WORDSTAR EASY EXTRA	52002	$48

Club members placing an order this month will receive a copy of Pyroto Mountain at no charge.

Hacking The ST Listing 2 continued from page 458

```
        p_dir[x].bits = '7';
        printf("No\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setparity(x)
int x;

/* this function sets the parity character based on operator input */
{
char pt;
char ans;
pt = p_dir[x].parity;
clear();
printf("The current parity setting is ");
if (pt == 'N') printf("None\n");
if (pt == 'O') printf("Odd\n");
if (pt == 'E') printf("Even\n");
printf("\n\nParity settings are:\n\n");
printf("1.    No parity\n");
printf("2.    Even parity\n");
printf("3.    Odd parity\n");
printf("\n\n\n");
printf("Please enter the number that best describes\n");
printf("the requirements of the system you are calling.\n");
fflush(stdout);
drain();
FOREVER
    {
    ans = Bconin(2);
    if (ans == '1')
        {
        p_dir[x].parity = 'N';
        printf("No parity\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '2')
        {
        p_dir[x].parity = 'E';
        printf("Even parity\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '3')
        {
        p_dir[x].parity = 'O';
        printf("Odd parity\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void setstr(x,y)
int x;
int y;

/* this function gets a macro string from the operator */
{
clear();
printf("The current MACRO %02d is ",(y + 1));
fflush(stdout);
shomac(x,y);
printf("\n\n\n");
printf("Please enter the new MACRO.\n");
printf("It may be up to 20 characters long.\n");
printf("You may insert a return in the macro at\n");
printf("any location by pressing the Esc key\n");
printf("Macro: ");
fflush(stdout);
drain();
getans(dstr,20);
strcpy(p_dir[x].mac[y],dstr);
}
void setnme(x)
int x;
/* this function gets a BBS name from the operator */
{
int len;
int y;
char *p;

clear();
p = p_dir[x].bname;
printf("The current BBS name is ");
fflush(stdout);
for (y = 0;y < 10;y++)
    {
    Bconout(2,*p);
    p++;
    }
printf("\nPlease enter the new BBS name.\n");
printf("It may be up to 10 characters long.\n");
printf("BBS Name: ");
fflush(stdout);
drain();
getans(dname,10);
do
    {
    len = strlen(dname);
    if (len < 10) strcat(dname,".");
    }
while (len < 9);
for (y = 0;y < 10;y++) p_dir[x].bname[y] =dname[y];
}
void setnum(x)
int x;
/* this function gets a dialing string from the operator */
{
clear();
printf("The current phone number is %s.\n\n\n",p_dir[x].phone);
printf("Please enter the new phone number.\n");
printf("Phone number: ");
fflush(stdout);
drain();
getans(dphone,31);
strcpy(p_dir[x].phone,dphone);
}
void shomac(x,y)
int x;
int y;
/* this function displays the old macro */

{
char *p;

p = p_dir[x].mac[y];

while (*p != '\0')
    {
    if (*p == '\r') Bconout(2,0xae);
    else Bconout(2,*p);
    p++;
    }
}
void setdstat(x)

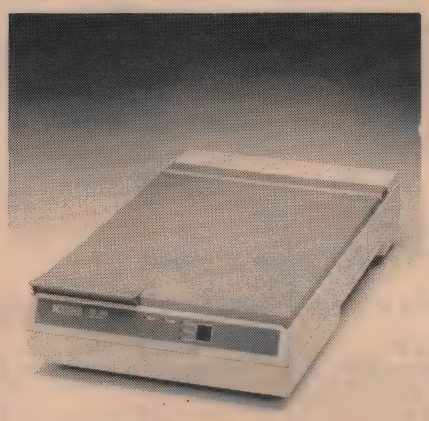
int x;
/* this function sets the dialing status character based on operator input */
{
char pt;
char ans;
pt = p_dir[x].estat;
clear();
printf("The current dialing status is ");
if (pt == 'A') printf("Logon\n");
if (pt == 'D') printf("Dial\n");
if (pt == 'S') printf("Set\n");
printf("\n\nDialing status settings are:\n\n");
printf("1.    Set the serial port, dial number and logon\n");
printf("2.    Set the serial port and dial the number\n");
printf("3.    Set the serial port only\n");
printf("\n\n\n");
printf("Please enter the number that best describes\n");
printf("the requirements for this number.\n");
fflush(stdout);
drain();
FOREVER
    {
    ans = Bconin(2);
    if (ans == '1')
        {
        p_dir[x].estat = 'A';
        printf("Logon\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '2')
        {
        p_dir[x].estat = 'D';
        printf("Dial\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    if (ans == '3')
        {
        p_dir[x].estat = 'S';
        printf("Set\n");
        fflush(stdout);
        delay(2000);
        return;
        }
    }
}
void newnum(x)
int x;
/* this function gets a logon number from the operator */
{
int numb;
char ans[5];
int res;
numb = (int) p_dir[x].num;
numb &= 0x00ff;
clear();
printf("The current number of macros needed\n");
printf("to log onto this board is %d.\n",numb);
printf("\n\n\n");
printf("Please enter the new number.\n");
printf("It must be between 0 and 10.\n");
printf("Number of macros :");
fflush(stdout);
drain();
getans(ans,3);
res = atoi(ans);
if ((res < 0) || (res > 10))
    {
    printf("Invalid number of macros.\n");
    printf("Number not changed.\n");
    fflush(stdout);
    return;
    }
p_dir[x].num = (char) res;
}
void setdly(x)
int x;
/* this function gets a logon delay from the operator */
{
int numb;
char ans[5];
int res;
numb = (int) p_dir[x].dly;
numb &= 0x00ff;
clear();
printf("The current time the board must be idle \n");
printf("before the macro is sent is %d\n",numb);
printf("This is tenths of a second!\n");
printf("\n\n\n");
printf("Please enter the new idle time.\n");
printf("It must be between 1 and 250.\n");
printf("Idle time in tenths of a second :");
fflush(stdout);
drain();
getans(ans,3);
res = atoi(ans);
if ((res < 0) || (res > 250))
    {
    printf("Invalid idle time.\n");
    printf("Idle time not changed.\n");
    fflush(stdout);
    return;
    }
p_dir[x].dly = (char) res;
}
```

COMDEX '88 Preview
continued from page 170

show two 24-pin, dot matrix models the Microline 390/391. Booth 1942.

Star Micronix Will Show New Line Of PC Printers

Star will introduce two competitively-priced seven-color dot matrix printers; the NX-1000 and NX1000C Rainbows; the new NX-2400 multifont, high resolution, 24-wire printer for business and home; and the Star LaserPrinter 8, that produces full-page bit-mapped text and graphics at up to eight pages per minute. Booth 1568.



Ricoh Will Demonstrate New Image Scanner

Ricoh will demonstrate its new RS320 desktop scanner. The versatile, compact image scanner can be seen at COMDEX/Fall, Booth #1788 in the Las Vegas Convention Center.

Communications...Multi-Standard And Multi-Speed Choices

ARK Will Introduce New 2400bps Dial Modem—The DM 222 is a 2400bps Hayes compatible modem. It complies with CCITT V.22Bis, V.22 A or B, Bell 212A, or Bell 103 standards.

Computer Peripherals Will Introduce Two New Modems—Computer Peripherals will have their new IBM PS/2 Hook-Up PS/24, a high-speed 2400bps internal modem and a low cost Hook-Up 9600, an internal 9600bps modem for IBM PC, XT, AT and PS/2 Model 30.

Fastcomm To Show New 9600bps Modem—The Fastcomm Communications new FDX 9624 is a full-duplex, 9600bps modem designed for interactive and rapid file transfer applications. It is an asymmetrical modem that operates at 9600/4800/2400/1200/300bps over dial-up or leased lines.

Ancillary Products...Comfortable Additions

Emerson Computer Power To Introduce Low Cost Desktop UPS For PCs—Emerson will introduce an economical off-line desktop Uninterruptable Power System (UPS) designed to fit under a PC monitor and still provide up to 1000VA of filtered, sinewave power. Booth 1383.

Engineered Data Products Will Show Adjustable Digitizer Stand

EDP will demonstrate their new EDP Digitizer Stand. The stand offers adjustability at an affordable price. To adjust the height, the user employs a

continued on page 462

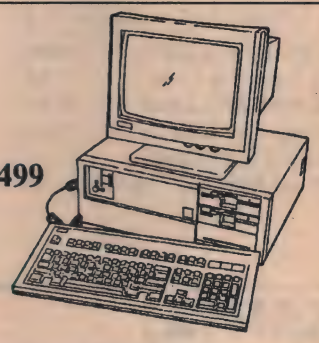
LASER COMPACT XT

IBM PC/XT COMPATIBLE
- 4.77/10 MHZ
- 360K Disk Drive
- 512K Ram (expandable to 640K)
- Parallel Port
- Serial Port
- Color Display Port (RBG)
- Monochrome Display Port (TTL Hercules)

Laser Compact XT $489
External Disk Drive $119
Carry Case $59

AST Premium COMPUTER PRODUCTS

Model 70 . . . . . $1499
- 80286 CPU
- 6,8,10 MHZ, 0 Wait States
- 101 Key Keyboard
- 1.2 MB Floppy drive w/controller
- AST FASTRAM memory board w/512K
- MS-DOS
- GW BASIC



Model 140 . . . . . $2699
- 40 Meg Hard Drive 28ms w/controller
- AST 3G Plus Video Card
- 1 Meg Memory

Plus Model 140 . . . . . $2299
- 40 Meg Hard Drive 38ms w/controller
- Everex Micro Enhancer Video Card
- 1 Meg Memory

NEC Pinwriters

- 24-wire Printer
- High-spd Draft 265 cps
- Letter-Quality 90 cps
- 360 x 360 dpi
- Built-in Push Tractor
- Auto Paper Loading
- Printer Menu Memory Set
- 80K Input Buffer

P5200 . . . . . $599
P5300 . . . . . $719

Panasonic Office Automation OA

FX RS-505 *Image Scanner*

- 400 x 400 DPI Resolution
- Halftones; 16 Gradations
- Scan Speed; 3 msec./line

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FLOPPY DRIVES

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Teac 360K Floppy Disk Drive	$79
Teac 1..2MB Floppy Disk Drive	$109
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1.44 Toshiba Floppy Disk Drive	$119

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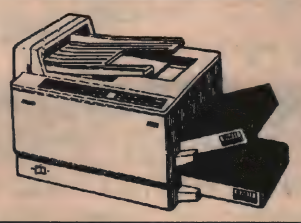

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The Mach 20
continued from page 27

16-bit RAM for normal DOS applications. You want to backfill as much DOS RAM as possible, because the Mach 20 runs software faster when it's in the 16-bit RAM.

All 8-bit memory on expansion cards should be removed, but memory installed on the PC motherboard must be left intact. For most PC users, this simply means disabling external RAM expansion cards, and using the 256K of 8-bit memory on the motherboard. Once all this has been determined, setting up the board is as simple as setting a couple of jumpers. Again, the Memory Plus installation utility program makes it easy.

The RAM on the Memory Plus board can be configured as either expanded memory (EMS) or extended memory. The provided EMS device driver must be installed in your CONFIG.SYS file, which can be done automatically by the installation utility. As expanded memory, it can then be accessed by DOS applications which support EMS (Lotus 1-2-3, Microsoft Windows, etc.).

Microsoft claims the Mach 20 is the first PC/XT product which fully supports all the features of the latest LIM 4.0 (Lotus- Intel-Microsoft) specification. Some of the features of LIM 4.0 EMS are faster memory page swapping, multi-tasking support, and larger page frames. Mach 20 has been even further optimized for better LIM 4.0 performance. The Memory Plus RAM can also be accessed as extended memory, by the special version of OS/2 Microsoft has created for the Mach 20 (described later).

Disk Plus Multi-Media Floppy Disk Controller

The Disk Plus option board is a small daughterboard that attaches to the Mach 20 board thus saving a slot. The board contains a complete floppy disk controller, and any other floppy controllers must be removed when it's installed. It can control two 3.5" or 5.25" floppy drives, in any density (360K, 720K, 1.2M, and 1.44M). The 34 pin floppy connectors can be directly attached to the Disk Plus, which provides an edge connector just like the normal floppy controller.

Disk Plus includes software support for the high density drive types normally not supported by a PC, including 3.5" and high density disks. It does this by including a BIOS extension ROM on board. Of course, in order to properly access disk files on these drives, a version of DOS which recognizes the types of disk drives you will be using must also be used or the DRIVER.SYS file must be installed (DOS 3.21 or higher).

Users who need or want the ability

continued on page 463

***PC Magazine* Laboratory Benchmark Series Release 4**
(all times in seconds)

System: Conditions:	IBM PC 8088/4.77	Mach 20 Cache Off	Mach 20 Cache On	Mach 20 16 Bit RAM
128K NOP Loop	10.00	13.40	14.61	4.17
Do Nothing Loop	10.00	14.23	2.96	3.57
Integer Add Loop	10.00	9.94	2.47	2.14
Integer Mult Loop	10.00	5.00	1.60	1.21
String Sort Loop	10.00	10.60	3.18	2.85
Prime Number Sieve	16.00	19.06	3.85	4.01

Table 1—Mach 20 CPU Test Results

CORE Disk Performance Test Program Version 2.7
Test Hard Disk Data—32.5 Mb, 611 Cyls, 4 Heads, 26 Sectors

System: CPU/Speed:	IBM PC 8088/4.77 Mhz	Mach 20 80286/8.00 Mhz
Data Transfer Rate (KB/sec)	241.0	777.1
Average Seek Time (sec)	99.8	98.2
Track-Track Seek (sec)	34.8	26.8
Performance Index	1.985	5.186

Table 2—Mach 20 SmartDrive Cache Test Results

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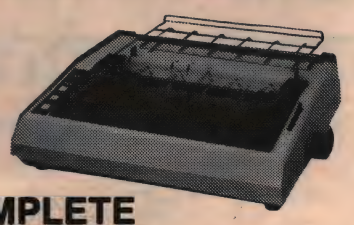

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COMDEX '88 Preview
continued from page 461

simple foot pedal while applying fingertip pressure. Booth 2974.

Telex Communications To Add Two New Computer Production Systems

Telex will introduce two new color Liquid Crystal Display (LCD) computer projection systems.

The MagnaByte Model 5040, for use with most IBM, IBM compatibles and laptop personal computers and the MagnaByte Model 5020, for use with the Apple II family of personal computers. Booth B910.

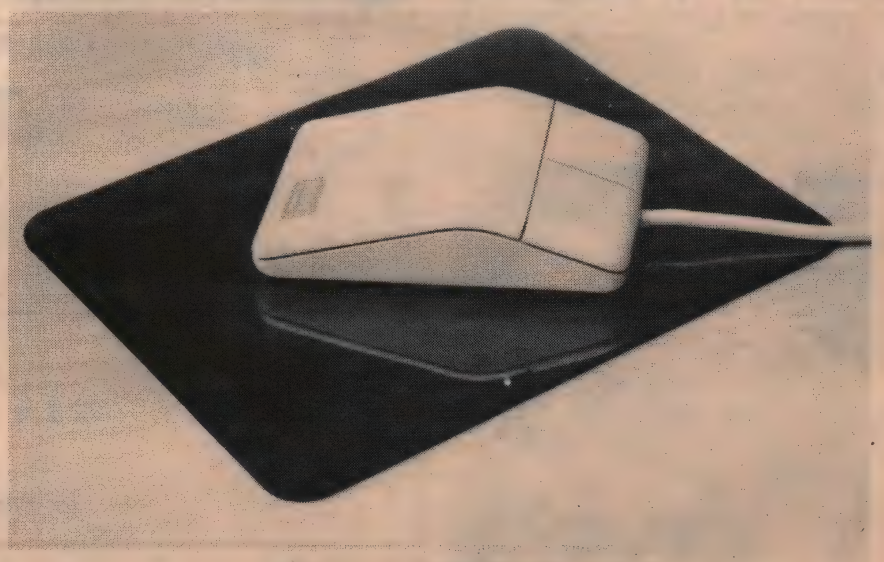
Tech-cessories To Show New PC Pillow

Tech-cessories will demonstrate their new and original PC Pillow. This keyboard cradle allows you to place your keyboard more comfortably on your lap. Booth #W149.

MSC Technologies Will Have The Next Generation Mouse At Show

The new PC Mouse II is a high-end optical input device. The new two-button ergonomically designed mouse features Ultr-res 2000 which allows customers to determine how fast they want PC Mouse II to move their screen cursor. Booth B1732.

Well, that is it for now. COMDEX/Fall '88 is so much more. It is a supermarket of parts and systems. It represents the pinnacle of technology and blue sky side-by-side. This is only the beginning to a larger story to come in January. See you then. ●



PC Mouse II Optical Mouse

The Mach 20
continued from page 462

to use different types of floppies with their PCs will obviously be interested in the Disk Plus option. It will also appeal to the user who has a limited number of slots available for expanding their PC. By replacing their existing floppy controller card with a Mach 20/Disk Plus combo, they can get improved performance and not lose a single slot.

Performance Specs

Since the Mach 20's 80286 completely replaces the normal 4.77 Mhz 8088 CPU, it can provide up to a six times performance increase. The actual performance increase is dependent on several factors: the software being executed, the amount of expanded 16-bit memory in the system, and whether the 16-bit data cache is enabled or not.

Table 1 shows the results of running PC Magazine's Laboratory Benchmark Series on both a stock IBM PC, running an 8088 at 4.77 Mhz and the Mach 20. As Table 1 shows, the Mach 20, with cache memory disabled, is about the same speed as a stock 8088. Actually, it's slightly slower for some operations. But, with the cache enabled, the CPU suddenly becomes 2-4 times faster.

With a Memory Plus board connected, the Mach 20 can run even faster. That's because all the RAM on the Memory Plus board is using a true 16-bit data path. With the cache enabled, and running software in 16-bit RAM only, the Mach 20 has very good performance indeed. The execution times noted in Table 1 were exactly the same as an 8 Mhz AT bus machine.

Since at least some part of DOS RAM will have to be in 8-bit memory, this maximum level of performance may not be realized by many Mach 20 users. But if software is running in expanded memory under LIM EMS verion 4.0, such as Microsoft Windows 2.0 or later, it should run even faster than on an 8 Mhz AT. This is because the Memory Plus control circuitry can switch memory tasks faster than an AT can.

SmartDrive Cache Software

Included with the Memory Plus upgrade is a hard disk cache program, called SmartDrive. This cache program can use part or all of the expanded RAM for a cache. When running the Memory Plus installation utility, SmartDrive can be installed into your CONFIG.SYS as an option. By using 256K or 512K of expanded RAM for SmartDrive, a Mach 20 equipped machine becomes an even better performer.

As Table 2 shows, when SmartDrive is added to the Mach 20 system, it dramatically improves overall hard disk

continued on page 466

Apple/Macintosh Compatible Computer Data Projection Panels

Dukane Corporation introduced 2 new Apple compatible LCD computer display panels at AppleFest 1988—the MagniView 342 and the MagniView 200. Placed on top of any transmissive overhead projector, each of the compact, lightweight panels allows real-time monitor data to be projected onto any large screen.

Dukane's new MagniView 342, compatible with the Macintosh, Mac+, Mac 512 and Mac SE, projects PC text and graphics in crisp, vivid blue on a light blue background—the color combination most preferred by focus groups. The unit features an enhanced high resolution 512x342 pixel display for sharp, detailed projected images.

Compatible for use with any IBM PC (and compatible) or Apple II family computer with RGB-TTL or composite video output, Dukane's MagniView 200 has a super twist, high contrast LCD with largest active available display area. The versatile MagniView 200 also projects bright, clear images in a pleasing blue-on-blue combination.

Ideal for use in educational and training programs, computer instruction and business presentations, Dukane's Apple compatible panels feature 4:3 aspect ratio (identical to that of a computer monitor), for distortion-free image reproduction; "Chip-On-Glass" technology (computer chips embedded in the glass), for added durability; high efficiency fans, heat tolerant LCDs and infrared filters for consistently cool operation; easy-to-use top-mounted image controls; and one year warranties.

For more information contact Dukane Corporation, 2900 Dukane Drive, St. Charles, IL 60174; (312) 584-2300. ●

First Challenger Center To Serve As Living Memorial

Two and a half years after the tragedy of the Challenger space shuttle launch, an innovative math and science learning center has opened at the Houston Museum of Natural Science as a living memorial to the crew.

Named "The Space 2061 Simulator," the Houston Challenger Center affiliate site was created by the joint efforts of the Houston Museum of Natural Science (HMNS), the Challenger Center for Science Education, and Apple Computer, Inc. Construction of the center was funded by a grant from the William Stamps Farish Fund.

The Space 2061 Simulator is the first in a planned national network of Challenger Center affiliate sites that integrate technology with creative, interactive math and science curriculum taught in the context of space travel. The learning facilities at the site allow students and their teachers to experience simulated space travel while enhancing their problem-solving, science and communications skills. The Houston site is the prototype and training facility for future affiliate sites.

The family members of the Challenger crew, led by Dr. June Scobee, chairman of the Challenger Center for Space Science Education and widow of Challenger Commander Dick Scobee, first conceived the idea for a network of educational centers to be a "living memorial to the crew—a tribute more fitting than one of granite and stone." An educator herself, Dr. Scobee believes, "The overriding challenge is to turn the tragedy of flight 51-L into a triumph of American resilience and resolve. The mission of the scientists and pioneers aboard 51-L is now our mission. It is a tribute to them and to the team of people in our nation who have come together to create the Challenger Center—not a statue or monument—but a program that brings the challenge of space more directly into the hands of this country's teachers and students. Today, we celebrate launching Challenger Center's first home here in Houston."

Apple Computer donated 11 computers as well as time and other resources to help design the first affiliate site. Betsy Pace, director of marketing for K-12 education at Apple, said, "As a company whose roots are in education, Apple is very pleased to be part of the Challenger Center project. The Challenger Center provides a practical working model of how technology can be used to prepare children for the 21st century. It also celebrates what is possible when the community, business, and educators work together for positive change. And because the curriculum created here stimulates the imagination and the interest of students in math and science, it provides an excellent example of how to teach critical thinking skills and teamwork as well as factual subject matter in a meaningful and exciting context. It's a model we hope will be widely imitated."

At the opening, Houston students will "rendezvous" with Halley's Comet in a simulation set in the year 2061. Simulator experiences will be offered to the general public in the fall at the Houston Museum of Natural Science.

"We are extremely proud to house the very first Space 2061 Simulator," museum President Truett Latimer said. "It is a unique science learning program which will add considerably to the educational programs the museum already offers. We will actively encourage other museums to replicate the program here. It is our wish that children across the country will have the benefit of a Space 2061 Simulator in their hometown science museum."

To date, more than 40 museums nationwide have expressed interest in becoming Challenger Center affiliate sites. Some of the first sites will be in San Diego, Seattle, Chicago and Atlanta.

For additional information contact Apple Computer Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408-996-1010. ●

MusicPrinter Plus

Temporal Acuity Products (TAP), is now shipping MusicPrinter Plus, a high-powered, fast, flexible, easy to use, Notation Driven Sequencer that prints and plays music for IBM and compatible computers.

MusicPrinter Plus is a new direction in musical score processing. MusicPrinter Plus is designed for composers, professional musicians, music educators, and hobby enthusiasts who want a publishing-quality musical printout from their 9-pin or 24-pin dot matrix printers. Musical scores of one hundred fifty to two hundred staffs can be printed from a single document file at maximum printer speed. MusicPrinter Plus offers fast, easy, single or multiple-staff part-extraction for printing. These extracted parts can then be performed through MIDI independently from the score.

With MusicPrinter Plus, there are no prescribed grids or inflexible barline systems, nor elaborate codes to memorize. A unique single-key character entry system lets you quickly call any character into the cursor, and you can place characters anywhere you wish.

MusicPrinter Plus makes possible the realistic performance of scores notated in up to forty-two staffs per system, using up to one hundred twenty-eight separate voices—more than enough to duplicate the instrumentation of a full symphony orchestra or concert band on 16 MIDI channels. Voice reassignment during performance are made from indications in the score.

MusicPrinter Plus uses the standard computer keyboard with optional mouse and/or MIDI keyboard. The composer, arranger, copyist, teacher or student places musical symbols and text directly on the screen, exactly as they will appear in the final printout. The principle of WYSIWYG (What You See Is What You Get) is basic with MusicPrinter Plus.

MusicPrinter Plus runs on any IBM, PS/2, or compatible computer with 640K RAM and addresses the following peripherals:

Screen Display—CGA, EGA, Hercules, PS/2 color or monochrome;

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MIDI Interfaces—IBM Music Feature, Roland MPU-401, Music Quest MIDI Co-processor Card, and Voyetra OP-4001;

Mouse Devices—IBM, Microsoft, Logitech

MusicPrinter Plus can be purchased for $395.00. Temporal Acuity Products is located at 300 120th Ave., N.E., Bldg. 1, Bellevue, WA 98005; (206) 462-1007 or 1-800-426-2673. ●

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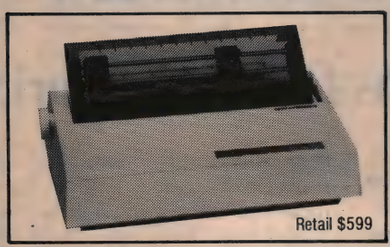
brother HR-15XL Daisywheel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Brother's all time most popular printer ... the HR-15XL delivers the highest quality printing possible. The HR15XL is an affordable daisywheel printer with full word processing functions. There's no need to sacrifice quality simply because of cost when you can have the Brother HR-15XL.

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- Original +4 Copy Capacity
- 90 Day Labor – One Year Parts

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brother HR-40 Daisywheel

The Brother HR-40 is the first *complete* daisywheel printer. The tractor and cut sheet feeder are built-in making it indispensable for processing all kinds of office printing jobs. The "paper parking" feature allows you to switch from continuous forms to single sheets without removing and reloading paper.

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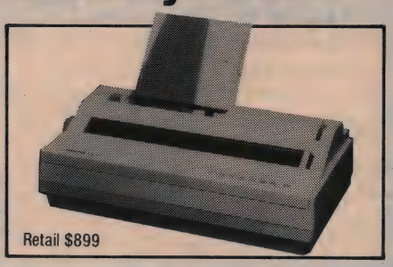
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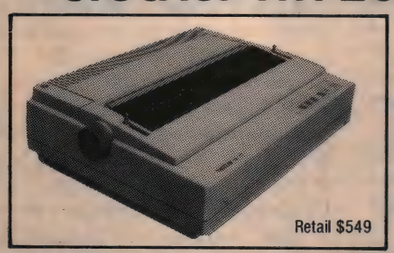
brother HR-20 Daisywheel


Retail $549

The Brother HR-20 is an outstanding daisywheel printer value. It produces excellent letter quality text (even 2-color printing) at a very enticing price. The optional KB-150 keyboard turns the HR-20 into an intelligent typewriter. The HR-20 is perfect for home or office word processing needs.

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- Original +4 Copy Capacity
- 90 Labor – One Year Parts

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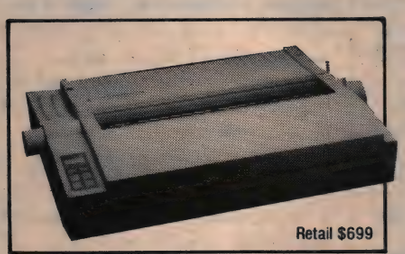
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You can achieve a professionally typeset appearance with the word processing versatility of the Premiere 35 Daisywheel. The wide 136 column paper carriage and built-in tractor will handle virtually any size form. The LCD exhibits print functions and indicates errors in plain English.

Your Price
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- 35 CPS Letter Quality Printing
- Wide, 136 Column Carriage
- Standard Parallel Interface
- Diablo 630, NEC 3550, Qume and Spring 11 Plus Compatible
- Built-In Push Tractor Feed
- LCD Display Exhibits Print Functions
- Diablo Compatible Ribbons & Printwheels
- One Year Manufacturer's Warranty

Panasonic KX-P3131 Daisywheel

Your Price
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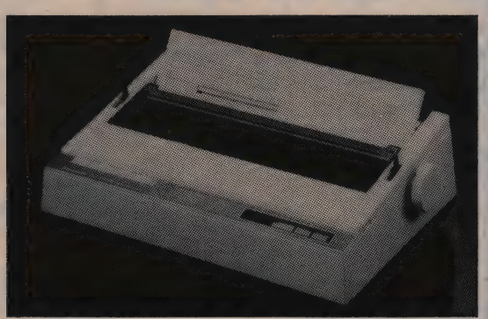
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The Panasonic KX-P3131 will do its best work printing letters, memos and reports. Printed characters are fully formed producing text identical to typewritten documents for the most professional appearance. It uses Diablo compatible ribbons and printwheels for easy replacement. The KX-P3131 is a durable, reliable printer.

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- 13.5" Paper Width
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The Mach 20
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performance. While disk seek and average access times are pretty much constant between a stock PC and a Mach 20 equipped machine, the effective data transfer rates can be almost tripled, and the overall disk performance index can be more than doubled.

Does It Do OS/2, Too?

Microsoft recently released a special version of OS/2 Release 1.0, for the Mach 20 board. Because of the hardware differences between a PC/XT and AT, the generic versions of OS/2 will not run on the Mach 20. Microsoft has modified the OS/2 system files for the Mach 20 and properly written OS/2 programs reportedly run just fine. This direct support from Microsoft for OS/2 is sure to be a strong selling point of the Mach 20 to some. However, we still have some reservations about it.

We spent the better part of two weeks trying to get Microsoft's OS/2 running on our Mach 20 equipped PC. The physical installation of both the Mach 20 hardware and the OS/2 software took only an hour or so. While the Mach 20 performed admirably under DOS and Windows, it steadfastly refused to boot OS/2, period. We spent several hours on Microsoft's technical support phone lines (which aren't toll-free by the way), trying to find the source of an annoying boot error. When all was said and done, we gave up on trying to run OS/2 as the primary operating system. Instead, we decided to keep MSDOS 3.21 on our hard disk for a while longer.

Does this mean that the Mach 20 doesn't run OS/2? Most definitely not! We have talked with those who are running it just fine on their Mach 20 equipped PCs. Whether the problem we experienced is just a fluke or not remains an unresolved question. But it appears from our experience that certain pitfalls are possible. Since we are still waiting for a suitable resolution of our own problem by Microsoft's technical support staff, our own endorsement of the Mach 20's OS/2 capabilities will have to wait for a later date.

Summary

For running DOS software, especially under LIM 4.0 or Windows 2.0, the Mach 20 system is an especially excellent performer. While we had some problems getting the OS/2 package running on our machine for this review, we believe that our problems were probably the exception rather than the rule.

The Mach 20 system provides a reasonable upgrade path for the many thousands of 8-bit bus systems already in service. While not as comprehensive a solution as a total motherboard swap, the Mach 20 delivers performance equal to or better than many 8 Mhz AT compatibles. By its modular design, it's more affordable than many other upgrade alternatives, allowing users to upgrade a system using an affordable modular approach. The Mach 20 will give many old PCs and XTs a new lease on life. It makes it possible for yesterday's PCs to tap into tomorrow's software, at a reasonable price. ●

PC Brands 386
continued from page 28

trols are readily accessible at the rear with protruding knobs. Not only can you set the height and width of the screen, but you can center the image that fits inside the matrix.

Brightness and contrast controls are on the upper left side of the case. The on/off switch is on the upper right side. Next to it is a text switch that allows you to switch screen colors to green, amber, or a pleasing white on blue, by depressing the button in sequence. Green and amber screens on color monitors aren't always satisfactory. Green is usually too intense, and the amber screen washes out. On the Princeton Graphics Ultrasync monitor, the amber screen is more yellow than amber, but provides adequate contrast.

Since the monitor will automatically synchronize with whatever graphics card you have installed, you have access to a wide choice of graphics cards. I removed the Paradise VGA card and plugged in a Genoa SuperEGA HiRes card to match the graphics output of the multi-user operating systems I was working with. The monitor will accept both TTL and Analog signals. A switch on the back of the case allows you to select the proper mode for your card. If certain multi-frequency or VGA cards are used, a 15-pin connector and cable is required. You can also set the color displays for 16-color EGA or 64-color VGA modes.

Summing Up

Since this computer was provided primarily as a working tool for the multi-user graphics project, and not for evaluation purposes, PC Brand did not include their usual package of MSDOS, user manuals, and support software. After working with it on a variety of multi-user operating systems, including UNIX, I was extremely impressed by its performance and the quality of its construction.

PC Brand's 386 systems are available in a variety of standard full-size, small footprint, and tower cases. Basic systems with 1-Megabyte of RAM, one 1.2-MB floppy drive, case with power supply, keyboard, and FDD/HDD controllers begin at $2200.

For additional information, please contact: PC BRAND, Inc., 954 West Washington St., Chicago, IL 60607; (312) 226-5200 or (800)-722-7263. ●

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—Errata—

The September 1988 *Computer Shopper* article "Hypertext For PCs," had an incorrect address and phone number for Owl International; publisher of Guide 2 software.

The correct information is, Owl International Inc., 14218 N.E. 21st Street, Bellevue, WA 98007; Phone 206-747-3203.

Getting The Most
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the next chapter is. The chapters will then be printed without a break and with no skip in page numbers. To know when to stop building a file, Trio allows you to check the memory remaining at any time.

Trio-Word provides for a forced page break but takes it one step further by calling it "blank Rest Page." With this you can blank the rest of the current page or blank several pages, if desired.

When it came time to print, the selections were simple. You set-up one time. You don't have to change the set-up unless you change equipment, but the set-up screen is displayed every time you print. I had to change a dip switch (2-3) on my Star SG-10 printer since Trio doesn't provide line feeds. Since my printer isn't a Commodore, I told Trio to translate to ASCII instead of Pet ASCII. The other defaults worked.

The "embedded Printer Command" require a little study. Trio allows you to embed a non-printing code in a document. For example, CNTRL S 1 sets the printer to double space; Flush right is CNTRL F; Justification requires CNTRL E. You can put several commands on one line, but they must be separated by a colon and ended with a carriage return. This is what the book said and it referred only to underlining a paragraph. This appears to limit underlining to an entire paragraph. I was, however, able to embed an underline command and a stop underline command so that I could underline a single word.

Finally, Trio-Word allows you to stop and do many DOS functions like formatting a disk without leaving Trio. When starting to save a file, Trio-Word does not prompt with the file name in use but does stop and ask you if you want to overwrite a file if there is already a file on the disk with the same name as you choose.

Trio-Calc

Trio-Calc uses the standard spreadsheet format and procedure pioneered by Microsoft Multiplan and, later, Lotus 1-2-3. It is a good, full featured spreadsheet. There is nothing fancy like graphics or graph making but it lacks little that you normally expect from a spreadsheet.

Its stated limitations are 99 columns or 4600 rows. Notice the "or"! In fact, the practical limits are near the default 44 columns by 111 rows. You can get 4600 rows if you reduce the size of the columns to 2 characters wide and only have 1 column. In practice you can get more rows than the default 44 but at the expense of the maximum number of columns. Some adjustment, therefore, is possible but not to the extent implied. To put this in perspective, Swift Calc has 250 Rows and 250 columns, Microsoft Multiplan for the 128 (EPYX) defaults to 255 rows and 63 columns.

You are not allowed to use DOS commands in Trio-Calc like you were in Trio-Word. You can use Scientific notation (a shorthand for writing and using very large numbers) and there is a provision for freezing rows & columns (to keep the titles of the rows and columns visible no matter where you are on the spreadsheet). There is no provision for "locking" cells nor for printing sideways.

All in all, Trio-Calc is fine for most home applications.

Trio-File

Trio-File is an unusual database. It appears to use Trio-Calcs format—a database built upon a spreadsheet. A cell in the spreadsheet format becomes a field in the database. A row in the spreadsheet/database becomes a record. You end up with a database that is presented on the screen like the "BROWSE" mode in dBase. An obvious advantage is that, if you have used the spreadsheet already, you know how to use the database.

The opening screen looks just like the spreadsheet. There is a default size of 664 rows (records) by 10 columns (fields). You start by labeling the columns (fields) across the top and adjusting their size. These row titles are "frozen" so that you can see them at any point in the matrix. After that you can simply start adding records. I prepared a simple name/address database. There is a very effective "copy" feature so I was able to duplicate a record 663 times to fill up the database (a quick way to print return address labels). This left a limit of 663 records, not very much but since I didn't use all 10 available fields (only 6), I reduced the number of fields (columns) to 6. Like the spreadsheet, if you reduce one, you can add to the other. This gave me

continued on page 468

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457 more records (rows). Now, with 1120 records, I can do most anything necessary in a home or college database. Of course, if you need more room, you could prepare a duplicate database for any overflow, but this would make things like sorting impossible.

Like the other two modules, the commands are listed at the top and bottom of the screen plus a help screen to explain them. I couldn't spend the time to enter 1120 different records but I did have 1120 identical records so I changed the last field in the last record to see how fast it would search it out. Trio-File found it almost instantly.

Finally, Trio-File does not warn you if you are about to save over another file or loading another over the one of your screen. There is a clear danger of pushing F5 instead of F6 when you want to save a revised database. This easy to make error would load the old one over the revised one, losing all your changes.

Integration

The key to an integrated set of programs is: do they integrate? Can you insert spreadsheets into a letter or report? Can you easily mail merge that letter with a database established with the Trio-File? Well, yes to all three but by using the same basic technique that you use if you are using Wordwriter 128, Swift Calc-128, and Data Manager 128 or, for that manner, if you are using Word Perfect, dBase III, and Lotus 1-2-3. You go to the spreadsheet or data manager and use its features to "print a report to disk." In other words you load the spreadsheet and re-save it in a form that the word processor can read. Once the spreadsheet is in the word processor it enjoys none of the spreadsheet features (all the formulas are gone), but it can be manipulated just like any other text. To mail merge from the database, go to the database and format your fields into the sequence that you want the word processor to use. Then save them in a manner that the word processor can read the fields one at a time and insert them in a letter.

Finally, subject to the problems listed, Trio is a good package. The lack of a spell checker is a fatal flaw for the likes of me but maybe not to you. I called Jeff Higgins at SoftSync about this problem. He said that there are no plans to add a spell checker at this time, but there has been talk of one plus a thesaurus.

Trio is no more "integrated" than are other packages that don't claim to be but is a useful group of programs in a small package and at the right price. By the time you read this, according to Jeff, the price will have been reduced to $29.95.

Letters

From L. Gettings, Fremont, California: "Wrong! Wrong! Wrong! Timeworks' toll free number is long gone, more's the pity. Enjoy your column greatly. You should be listed as one of the contributors (on the Contents page)." **Answer:** Right on both counts L. About the phone number, see Raymond's letter next. As to making it to the Contributors list, I guess the editor doesn't want me to get too cocky. Oh well, writers are an unruly lot, and we have to be kept in our place.

From Raymond C. Bryan, St. Paul, MN.: "You know, not every one is as thrilled with Timeworks' programs as you are. The ones I've seen were unfriendly, inflexible, or slow and most suffered from 64&128 syndrome—they work in 64 mode only and do not take advantage of any of the beauties that the C-128 provides in its native state. Also, while the company does have a toll free help number, I have been referred to the regular you-pay long distance number when I call. I prefer Digital Solutions solutions; they are faster, more thought out, more flexible programs and much more reasonably priced since they deliver greater value/byte." Ray also enclosed a copy of a letter to Timeworks that expressed in more detail what he thought of Timeworks programs. **Answer:** Ray, it's not my business to defend Timeworks nor my intention to turn this into a Timeworks column. Every "computer nut" has his software favorites. This, all too often, is based on which program they started with and which one they know best. I'm no exception, but I do believe I recognize part of your problem with Timeworks programs. In your letter to Timeworks you gave me several clues. "I purchased Sideways." "I had seen Word Writer shortly after I bought my C-128 albeit in 64 mode." "I got dumped back into BASIC 2.2." "The software puts my two sided 1571 drive into single sided 'stupid' mode." The only program you referred to as a 128 program was Pocket Planner 128. All of the other programs appear to be the 64 version. I like your term "the 64&128 syndrome." When the 128 first came out, all the software companies started labeling their C-64 products 64/128. In fact these are nothing more than repackaged 64 programs that your computer can run when it is acting like a 64. Big deal! If you had wanted that you wouldn't have bought a 128! Go back and look at all the software you dislike. If it will run on both, you bought programs that throw away all those wonderful features of the 128 that you paid extra for. The original Word Writer for the 64, was all the things you say. Even Timeworks must agree since they have replaced it with Word Writer 3 for the 64. If you are not totally turned off, take another look at Word Writer 128, Sideways 128, etc. If you prefer Digital Solutions products, however, why bother! There's nothing wrong with their Pocket Writer 128 and Pocket Filer 128. As a matter of fact, I haven't tried it, but Pocket Filer 128 has to be faster than Data Manager 128. If you recall, I complained about Data Manager 128's speed (or lack of it) back in the June '87 issue!

As to the comment about the 800 number, you are not alone! Since I reported what good service I got there, I have been covered up with irate complaints—so I decided to go to the

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source again and find out why the number was discontinued. I called Gary Foreman at Timeworks.

SHOPPER: Just one quick question this time, Gary, since shortly after I bragged on the good service I got from your 800 number I've been getting complaints because it's not there anymore.

GARY: Yes, we know there are many people who are disappointed that the 800 line was discontinued; however, we also have many people, who are not so vocal about it, that are happy we discontinued it because now they are getting through to us. The problem we had with the 800 line was that the calls on it were just lasting forever. Somebody would get through on the 800 line and once their questions were answered they would start chatting about their aunt that lived in DesPlaines or how the Chicago Bears were doing and a call that should have only taken five minutes was usually taking 20 to 25. I can't tell my people to be rude and say: "Your questions done and we can't talk anymore."—I wouldn't have my people hang up on them but, likewise, one of my agents here that could normally take about 80 calls a day if he's on a non-800 line was taking about 25 or 30 calls per day. The bottom line is that by discontinuing the 800 number we were able to triple the number of calls that were taken through. We felt that it was more important to get more people in and have their questions answered than having the other people getting their questions answered and having a good time while they did it and many others just getting busy signals. I really wish we could have kept the 800 line but the bottom line is that we just couldn't get anywhere near the number of calls in that we can without the 800 service.

SHOPPER: OK Gary, I'll pass that on. Is there anything new to report?

GARY: I know your column is on the 128 and we don't have a lot of news in the Commodore arena.

SHOPPER: OK, then let me ask about Word Writer PC for MSDOS machines. I just looked at it and was disappointed to discover that it didn't have one of the best features of Word Writer 128—that is, On Screen Highlighting.

GARY: You mean like for italics and things like that?

SHOPPER: Yes, when you select bold, italics or underlined with the C-128 version, the characters are displayed that way on the screen.

GARY: Yeah, the Commodore 128 is nice because it's easy to work with graphics on the screen. In the MSDOS line you are either in "graphics" or you're in "text" but there is no "in between" like there is in Commodore. The only way to do it in a MSDOS machine is to have a completely bit-mapped screen where you are in graphics all the time in both the regular characters as well as the italics and bold. That's the way Microsoft Word does it.

From Roger Jones in Bartlesville OK: "I enjoyed your article in the April *Computer Shopper*. I am glad to find someone else shares some of my feelings about Sylvia Porter's Your Personal Finance Planner. Your article reminded me of my letter that was written to Timeworks exactly 2 years ago today about the C-64 version. I had commented on many of the same things your article covered. The 20-second delay writing to disk is also very annoying to me. I am sorry to hear that they have not done anything to reduce this long wait. This long wait also exists in the reconciliation (just to mark the check as cleared) and is even longer in the update mode. I feel that there are several ways that this delay could be reduced or at least deferred. With the C-128 there should be enough memory to buffer some of these transactions and only write when the buffer is full and at the exit of the ADD transaction mode or transactions could be stored in the RAM expansion module as you suggested. Both of these options would require a long pause later (during file update) but at least the annoying delay after each transaction would be eliminated.

I was glad to hear that the "Act," Ref#, and "Date" fields of the last transaction can now be recalled with the F2 key. I would have preferred to have them retained as the default and use the F2 key to blank these fields when they weren't wanted. The incremented Ref# (also suggested in my letter) seems very desirable.

I enjoy your C-128 articles in the *Computer Shopper*. I was a little upset a few months ago when the index listed some strange articles under the Commodore heading. I am the editor of the

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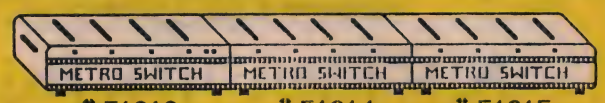

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MaxTech

CP/M Column

by Cheryl Peterson

Anytime I consider that maybe this column has finally run its course, you folks inundate me with mail convincing me that this column is even more necessary than when I started it. This month was no exception. In fact, there is so much mail I'm not sure it will all fit in one column. I'll try to get in as much as I can. Thanks to all who have written. Your letters keep me working to make this column better.

Ralph At Poseidon

Dear Cheryl:

Many thanks for the super write-up in the August '88 *Computer Shopper*. It is appreciated.

There is one very important boo-boo that I would like *Computer Shopper* to correct in the next issue and that is the cost of the complete Catalog is $6.75 not $5.25!! All the other info is correct.

Now to something more to the point and that is the Ted Chidester "problem." It would be of interest to know what version of dBase II he has and I agree it is probably not a hardware problem. We have used this program for some time with no problem. Those that we did have were solved "in-house" and looking back they were simple (overlooked command, incorrect syntax, etc.) but at the time they were "major." If Mr. Chidester would like to send the problem disks/program to us we would be glad to see if we can "help." No Guarantees, No Promises, etc. We get lucky!?!?

Now to a success story. Mr. van Loon, who saw our address had a "major" problem with WS v4.0 with printing out the PRINT.TST program and after several letters and phone calls we got it is just as it's supposed to be. His setup is as follows: C-128, Xetec Super Graphic interface and Star NX-10. The problem (as usual) is in the interface. The solution is as follows: Switches 3 and 4 "on" (up), then in BASIC (C-128 mode) type direct:

OPEN 1,4,7:PRINT #1:CLOSE:
BOOT (hit return key) Then at the A> Prompt type:
CONF PRT1 = ASCII5 (hit return)
then type WS to boot the program.

Needless to say there must be a boot disk with CP/M on it for this to boot and the CONF.COM must also be on the disk so it behooves the user to PIP these on the same disk as WS. Also note that most of this can be put in a PROFILE.SUB file which will do the work automatically.

Also there is a whole bunch of stuff you can put into the PROFILE.SUB such as turning the 40 column mode display off, turning off the double check save with the C1571.COM, PIPing all the working WS files to 1570 RAM for SUPER speed WS, etc. We have found that the PROFILE.SUB is underused and misunderstood. If you feel this is something that would be of use to your readers, I would be glad to outline how to build a PROFILE.SUB and its use.

Great to have you and the column back.

Ralph Lees

Thanks again for writing Ralph and I'm sure the readers would be interested in details on how to use PROFILE.SUB. I'd be happy to include your instructions here in the column. Just send them on in. In the meantime though, another of our readers has some suggestions along the same lines.

Dear Cheryl:

First off, I really appreciate all the help you have given us CP/M users. Both here in *Computer Shopper* and in *FOGHORN*. I would like to start by saying if you use the C-128 for any serious CP/M work at all, you simply must get the 1750 RAM cartridge. Less expensive than a disk drive and a whole bunch faster. (See PROFILE.SUB later for quick and easy use of the M: drive.)

Perhaps I can help Rick Crone (March '88) with his question. If you use both dBase II and dBase III + , look for a book called *dBase Demystified!* I found it at the public library. Good publication as it lists the commands for all three dBases and provides examples of the syntax. This is most helpful if you are trying to work with more than one edition of dBase. Secondly, Rick doesn't mention if he is trying to use dBase II or III + (there is a difference, but I don't know what the difference is because I use II and III +).

Anyway, if Rick is using III + , there is a program included called dCONVERT.??? [read the ???s as "I don't remember if it's a COM file, a PRG file or an EXE file"] dCONVERT is menu driven and will also convert dBase II program and DBF files into III + format. You can also use this to

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local Commodore Users Group and use Pocket Writer 2 on the C-128 for our newsletter. Would Word Writer 128 really be easier to use? Roger also enclosed a very professional looking newsletter from the Commodore Users Group of Bartlesville (CUB). **Answer:** Thank you for your letter and the newsletter, Roger. I particularly enjoyed your article on how you prepared the newsletter. I doubt that it would be worth your while to change to WW-128 since your newsletter looks so good. With WW-128 you would, perhaps, have to print the columns the same way that you do now—that is, manually changing margins, (for a complete description of how to do two columns manually, see this column in the June '87 issue) etc.—also, see the September '88 issue: Bill Clark, a reader in Washington who is also the editor of a newsletter, explains how he prints his newsletter with WW-128 and a Citizen MSP 10 printer. He prints his newsletter in two columns with one operation.

If your by-laws allow, please put me on your mailing list for your newsletter. I still say the real knowledge about computers can be found out there in the User Groups!

For more information on Word Writer 128, Data Manager 128, Swift Calc 128, and Sylvia Porter's Personal Finance Series, contact Timeworks Inc., 444 Lake Cook Road, Deerfield, IL, 60015. Wordstar and Wordstar Professional Release 4 are products of MicroPro International Corporation, 1299 Fourth Street, Suite 400, San Rafael, California, 94901. dBase II and dBase III Plus are by Ashton-Tate, 10150 West Jefferson Blvd., Culver City, CA 90230 1-800-437-4329. Microsoft Multiplan by Epyx is from EPYX 16011 Northeast 36th Way, P.O. Box 97017, Redmond, WA 98073-9717. (800) 426-9400. Lotus 1-2-3 is a product of Lotus Corp., 55 Cambridge Pkwy. Cambridge, MA 02142. (617) 253-9150. Super Chip 128 and the Super Chip "C" are marketed by The Library, P.O. Box 1321, Pensacola, FL 32514-3121. WordPerfect is from WordPerfect Corp., 1555 North Technology Way, Orem, Utah 84057. (801) 225-5000. The Star SG-10 is marketed by Star Micronics, #3 Oldfield, Irvine, CA 92714, (714)768-4340. Trio is a product of Softsync, Inc., 162 Madison Ave., New York, NY 10016. (212) 685-2080. Pocket Writer, Pocket Filer, and Pocket Planner are products of Digital Solutions, P.O. Box 345/Station A, 30 Wertheim Ct., Unit 2, Richmond Hill, ONT., Canada, L4B IB9. (416) 731-8775. ●

Red Storm Arriving For The Commodore 64/128

Red Storm Rising focuses on the tactical operations of an American nuclear attack submarine after a crushing invasion of Western Europe by the Warsaw Pact. The player's mission as submarine commander is to locate and destroy Soviet submarines and surface vessels as they leave their base near the Arctic Circle, before they can reach the Atlantic to disrupt the shipping of U.S. men and supplies to the battle front.

Red Storm Rising is based on Tom Clancy's best-selling novel of the same name. Clancy is considered by many to be the most knowledgeable and credible writer of military fiction. Software super-star Sid Meier, widely regarded as the foremost designer of military computer simulation, designed and wrote the game. The two collaborated on Red Storm Rising to ensure that it meets both men's high standards for realism and authenticity.

The new MicroProse game presents the player with five types of radar and sonar devices, five classes of sub-launched missiles, and three versions of programmable torpedoes. These systems include sonar that can categorize an enemy submarine by the "signature" of its propeller noise, missiles that fly through the air before plunging through the water to strike submerged submarines, and "smart" torpedoes that can turn and home in on their targets.

In modern submarine warfare the ability to hear enemy ships—and to avoid being heard by them—is crucial. As Clancy states in his introduction to the game's manual, "It is not unusual today for a submarine to detect a surface ship, on sonar, at ranges over thirty nautical miles." Red Storm Rising, therefore, accurately represents the equipment carried by modern submarines to reveal ambient noise levels in the surrounding ocean, the locations of relatively loud patches of water in which a submarine might hide, quiet zones in which a sub might stop and listen, and the depth and strength of thermal layers which provide conduits for the transmission of sound to and from the enemy.

"The high-tech gear produces a riveting effect," Meier said. "With all the data and high-tech decisions the player has to make, the pressure of playing cat and mouse with another sophisticated submarine can be awfully intense."

Throughout the game the player can view large-scale strategic maps and animated screens to observe how his tactical success is affecting the progress of the war. "Knowing that he has an impact on the big picture, that he isn't just racking up points," Meier said, "compounds the player's excitement and his involvement in the game."

Tom Clancy burst upon the literary scene in 1985 and now has four best-selling novels to his credit. Sid Meier has been an innovative game designer since his first title *Hellcat Ace* in 1982. His award-winning computer games, including Pirates!, F-15 Strike Eagle and Silent Service, a simulation of World War II submarine action, have sold more than 1.6 million copies worldwide.

Meier designed Red Storm Rising with Arnold Hendrick, whose writing, research and design work on MicroProse's Gunship, Project: Stealth Fighter and Pirates! have earned high praise from software reviewers. For Red Storm Rising, Hendrick has written a 105-page manual that explains the complexities of nuclear submarine warfare in admirably clear and simple terms.

Suggested retail price for Red Storm Rising is $44.95. A joystick is required.

For additional information contact of MicroProse at 180 Lakefront Dr., Hunt Valley, Maryland 21030; (301) 771-1151 Ext. 228. ●

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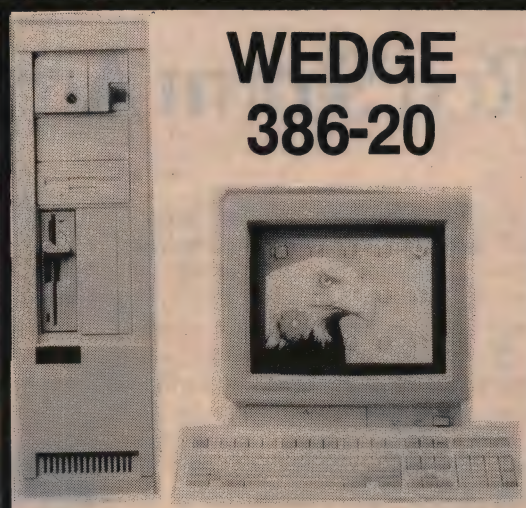

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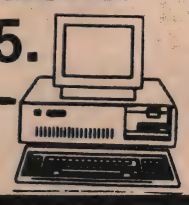

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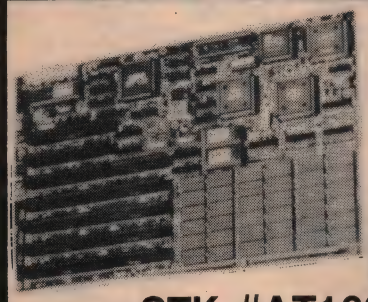

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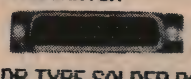

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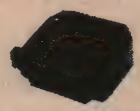

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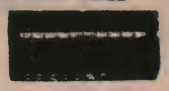

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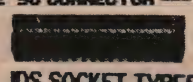

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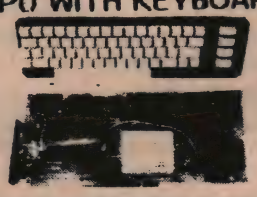

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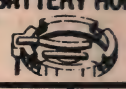

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CP/M Column
continued from page 470

convert a III + DBF file into II format, but not to convert III + programs downward. The program will do the best it can and will mark program lines with an * (REM) if it can't convert them for some reason. The program will also annotate the new program with * for areas of the dBase II program it converted to III + , such as changing "DO WHILE .T." to "DO WHILE T." I do quite a bit of programming at home on my C-128 but use an IBM clone at work. Rather than having to print out the dBase II program files and re-enter them at work, I just take the disk in and using RDCPM transfer them to the Zenith hard drive. I then use dCONVERT (run from within dBase—DO DCONVERT). I am in the habit of programming in the III + syntax and usually am unable to test my programs at home because I use commands available only in III + . But the conversion works good and enables me to get quite a bit of work done at home.

I have prepared two different system disks—one for dBase II and one for WordStar (recently upgraded to 4.0 which is great). The dBase disk has DBASE.COM, DBASEMSG.COM, all the DBASE overlay files on it as well as SCREEN40.COM, NSWEEP.COM, SUBMIT.COM and the PROFILE.SUB which is created with WordStar in non-document mode. The PROFILE.SUB file contains the following commands:

```
screen40 disable                [turn off 40-column screen]
pip m: = a:pip.com              [move PIP.COM to the M: drive (RAM)]
m:                              [change to M: drive for speed]
pip m: = a:dbase*.*             [copy all dbase files to M:]
pip m: = a:nsweep.com           [copy nsweep to M:]
erase pip.com                   [obvious—not needed anymore]
dbase                           [start dBase]
```

I have a similar setup for WordStar as well, but since upgrading to WordStar 4.0, this takes two disks to power up. Prior to WordStar 4.0, I could boot dBase, put my WordStar version 3.3v WordStar disk in drive A: and push the reset button. Both dBase II and WordStar fit into the 1750 RAM expansion nicely and I still had room to spare. But because I also put the "extra" programs (ANAGRAM, WC, TW, etc.) into RAM WordStar 4.0 take up all but 20K. Therefore, I don't use it with dBase, but rather separately.

In response to Wynn Teasley's letter (same issue—his problem may be the version of dBase II he's using. I've been using version 2.3B ever since I got the C-128 and had no trouble when I got the expansion cartridge. In fact, it has become easier. I can't remember if I had to re-install dBase or not, but that shouldn't be too hard. And your response to Wynn was somewhat confusing. You said that most CP/M systems only recognize drives up to letter N and that this could be the source of his troubles. If I remember my A thru Ns correctly, M comes before N and therefore should be seen by CP/M + . Anyway, keep up the good work. I enjoy reading your columns and many articles.

John Gray

That is a very good illustration of how to use a PROFILE.SUB to speed up your work. With the RAM expansion disk, it is very easy to avoid the slowness of the Commodore disk drives. One caution that needs to be made is that when you save your files, if you are logged to the M: drive the file is saved in memory and not on disk. Be sure that you save your files to the disk drive periodically. If you have a power drop or some other line difficulty, you could lose a good deal of work. So remember to save your work often. This may seem like an obvious precaution, but some people forget and then curse themselves for hours while they are trying to recreate the lost work.

You are right that M comes before N. (You'd think with a five year-old in the house that one wouldn't escape me.) The concensus of John's problem seems to be that his use of the dBase editor that came with his version of the program is the culprit. I've had several letters explaining that the editor was faulty.

In fact, I'd like to thank John of Eagle River, Arkansas for writing and reiterating the editor problem. Though I'm not running his letter since it repeats information already used in the column, I do want to thank him for writing. He recommends using non-document mode of WordStar for creating dBase program files.

Graeme Payne of Summerville, SC also wrote with the same information, but adds the caution that when using WordStar non-document mode be sure to keep your line length to less than 79 columns. He quotes from a book called *Advanced Programmer's Guide Featuring dBase III and II* by Luis Castro, Jay Hanson and Tom Retting published by Ashton-Tate and copyrighted 1985. While Mr. Payne admits being an MSDOS user, he did write when he recognized the problem. (Hmmmm, wonder why an MSDOS user was reading this column?)

This is a very good illustration of the fact that many people can be aware of a solution to a problem and yet some CP/M users out there just haven't gotten the word. So please, if you have information that you think will make life easier for others send it on to me. It won't go to waste. And even if it duplicates information provided by others, you may have a unique slant that someone else doesn't.

Another Letter About dBase

In your August '88 column, Ted Chidester describes his problem with editing dBase II program files, which eventually becomes garbled. He thought it might be a heat problem with his computer, and you suggested it might

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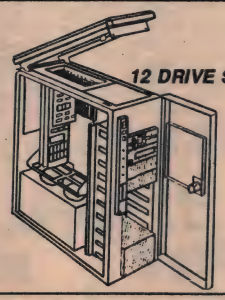

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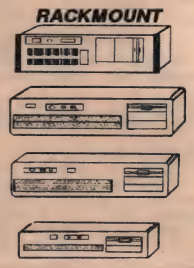

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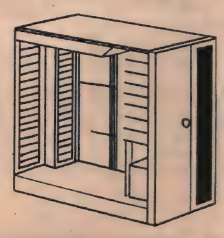

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CP/M Column continued from page 474

be an incompatibility between the C-128 and his version of dBase. I suspect he has run afoul of the infamous dBase MODIFY COMMAND editor. This editor cannot handle large files, but I believe it responds in just the way he described rather than refusing to work with an oversize file. The problem is aggravated by moving back and forth a lot in a file while editing. Also, if MODIFY COMMAND is used with data or index files open, the files may become cross-linked. The cure here is to issue the CLEAR command before using the editor.

A much better solution, almost universally used by most serious programmers, is to avoid using the dBase editor at all. Instead, get out of dBase and use some plain ASCII text editor, such as WordStar in non-document mode. If you use Document mode, WS will set the eighth bit of some characters high (it should be low for ASCII characters), and dBase won't know what to make of it. If you do that accidentally, WS 4.0 lets you convert it to non-doc. For earlier versions you'll need a filter program; there are several in the public domain.

MSDOS users who want to use the pop-up SideKick Notepad as their editor should be aware of a couple problems. First, dBase doesn't go to the disk for a program if it still has it in memory. So if you run a program, edit it and run it again, dBase will use the old, unedited version. The command RESET B: (or whatever drive your program files are on) will force a reread from disk. Second, and more serious, SideKick modifies the keyboard driver such that pressing Ctrl-C in dBase may dump you right out to the DOS prompt with your files still open. Use PGDN instead. [Note: SideKick is not available for CP/M and the C-128 doesn't have a PGDN key.]

As far as I know, each 8-bit CP/M version of dBase II was the same for all computers, except for an installation procedure to set the cursor and screen control commands. When dBase was bundled with the computer the installation was usually preset and no installation file was supplied. I haven't heard of any version that used more than the usual 64K of memory. If at all possible, dBase II users should be running dBase version 2.43* (don't ask me why they put an asterisk after the version number). This was the last version of the program, and has significantly fewer bugs (Ashton-Tate calls them anomalies) than earlier versions. But if they got rid of all the bugs, it just wouldn't be dBase.

Ashton-Tate maintains a bulletin board at (213) 538-6196 (300/1200 baud) or (213) 324-2188 (2400 baud). 8N1 works fine. [Author's note—that's 8 bit word, no parity, 1 stop bit.] I've just been on once and don't have full access to it, but it doesn't appear that there is much on dBase II. They also have an area on CompuServe (GO ASHTON) that I'm told is excellent. (I don't use CS) and another on the Source (ATSIG) that is so-so. A-T also distributed a file of tips, anomalies and work arounds for dBase II and III that should be available on some BBSs. It appears to form part of a tips file available for searching on ATSIG. The dBase III part of the file appears to be on the A-T BBS as DB3TIPS.ARC and there is another for III + , DBANOM-1.ARC. I found no similar listing for dBase II. These files could be printed out, but it's generally easier to bring them up in a word processor or a good file lister and do a search for a topic of interest.

Everett Ogden

I hope Mr. Ogden's letter contains some information that you dBase programmers can use. Those of you with a modem may want to try using your phone to get more information. Thanks for writing, Mr. Ogden.

Another Printer Problem Solution

George Koll writes with a solution to the print problem we were discussing last month. As some may remember, when using WordStar, problems can arise when installing your printer. Koll found a way to solve the problem that does not require having ten print drivers on your WordStar disk, thereby saving room on the disk for other files.

Dear Ms. Peterson:

I noticed your comments on John Rebers' CP/M "WordStar 4" printer driver tip which, you reported, came from the January *FOGHORN* concerning the necessity of at least ten printer drivers from the "Printers" disk for the program to cease giving the "Can't use that printer, incorrect name or not

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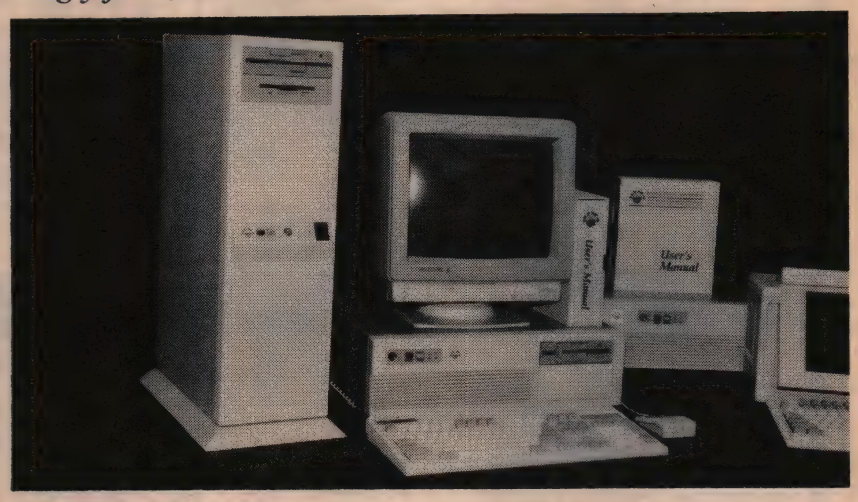

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CP/M Column
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enough memory" message on a Commodore 128 with an Epson printer.

I am active in the local Kaypro Users Group (now renamed from WA2KPU to Walla Walla Computer Club) and I can tell you that every purchaser of CP/M WordStar 4.0 I know of has gotten that message when they tried to print. In most cases the printers were Star Micronics/Gemini printers (Epson compatibles) but one was a Diablo-compatible (still another daisywheel, a DaisyWriter, is still not printing, though I am not certain the owner has followed my instructions, which follow).

By blind, desperate experimentation I found that WordStar 4 will let you print with the drivers you want (less than ten—I had never heard of this solution until your article). If you select the driver you wish from the Printers disk, immediately print something (I believe I had to hit the reset button somewhere in here and for some reason printing something is important—it seems to make the program line up properly) using the specialized driver for your printer. (In other words, even if you choose Gemini 10-x on the WINSTALL menu, you must choose GEM10X from the special "Printers Disk" options and then actually print something with this driver, which you should be able to do somewhere in here, though I think you have to push the reset and come clear through the print prompts to "Name of printer?" to do so.) Then go back to WINSTALL immediately after printing and select your-printer (or the printer it emulates) for the WINSTALL menus. After this, you will be able to print and you don't need ten drivers in your WSPRINT.OVR file, either. As I said, there is at least one use of the reset button in here and maybe two (you have to reset again after installing your default printer from WINSTALL, but I can't remember).

Also if you could point me toward some very specific, step-by-step instructions on installing MEX and IMP modem programs for a simple acoustic coupler modem (such as the "D-Cat" by Novation), I would be very appreciative. In my experience in the users group, there is a great lack of communication between the highest "gurus" of CP/M (whom most of us just read about) and the average, computer literate club member. I remember Ted Silveira in his now-defunct "Flea Market" column in PROFILES in the Sept. '86 issue alluding to "CP/M Assembly Language Programming" by Ken Barbier; a book on CP/M which taught him most of what he knows or something to that effect. I immediately phoned the bookstore only to learn that the book was out of stock and out of print. (Anybody got an old copy for sale?) The old issues of PROFILES, for example, gave step-by-step instruction and dealt with "nuts and bolts." Now many magazine articles assume that one either knows a) nothing or b) everything.

I would also be interested to know about 3½"drives for CP/M Kaypros, if anyone has ever heard of such a thing. I know that companies like Advent and MicroCornucopia produce(d) ROM chips for these machines that allow them to use 5¼", 96tpi, quad-density drives. Would these ROMs also format, read and write quad-density on a 3½" drive if one knew how to install the drive? If so, which 3½" drives would work and how does one install them? If not, is there such a ROM available that would, or a ROM software combination?

Some practical, "how-to" intermediate level articles in the CP/M magazines would be greatly appreciated, although this CP/Mer is grateful to anyone who even mentions this operating system in the age of OS/2.

George M. Koll

I can remember when I first started using my old Osborne 1. I spent all day trying to install the print driver for my Mannesmann Talley so I could use the special print modes with SuperCalc. I just kept experimenting until I finally got it right. By then my husband came home, took a look at what I had done and proceeded to explain to me exactly why what I did worked. Sometimes, though, experimentation produces results and we never do figure out why it works. With this hint to go on, maybe some of you out there can figure out

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how to get your printers working without having to waste the disk space. Good luck!

If the D-Cat uses the Hayes AT command set, you should find it easy to locate a copy of MEX and/or IMP already configured for your modem. To tell you the truth though, your best bet for this one is to call FOG. (Join FOG!) The First Osborne Group has quite a few modem experts on the staff. They run a number of bulletin boards and I know they already have MEX and IMP running with Commodore-128s. The kind of articles that you are looking for are often found in the *FOGHORN*; FOG's monthly user group magazine. Back issues of *FOGHORN* can provide a wealth of valuable information. If you haven't joined, check into it. You'll be glad you did.

While I can't be much help to you with the 3½ inch drives (I'm not really a hardware guru) perhaps some of the readers out there can offer some help or advice. Anyone have any ideas on how to hook up a 3½ inch drive to a Kaypro CP/M computer?

Dear Cheryl:

First off, I want to thank you for your unfailing support of the Commodore line of equipment in your column. In a magazine overwhelmed with IBM oriented ads, stories, etc., it's good to see time spent on the Commodore (even if it is under the heading of "Classic Computers"). I have found your column to be an invaluable source of information a number of times.

Now, to the main direction of this letter. I have come up with an idea that, in my opinion, would considerably expand the current public domain selection for the Commodore 128. As you noted in the July '88 column, the C-128 is almost three years old. Even with this amount of time, the base of really good, quality software is not what one would call "astounding." GEnie, from what I have seen has a rather sizable collection—as do, I assume, most of the major online networks. Still, if you look carefully, there's an amazing amount of repetition in this software—God knows how many file copiers, track/sector editors, memopads, and the like have collected over the past 2+ years. Not faulting their authors in the least, but seeing forty or fifty 10-20 block programs that all basically do the same function is, in my opinion, not saying much for the 128-user's support. I make it a practice to take these programs and if possible, mesh the best features of all of them into one large program. For example, let's say I have a disk editor, file copier and general disk utility (renaming files, etc.). I would attempt to compile all of these into one more useful and easier to store program.

Enough of my rambling, here's my idea:

I want to try and start some sort of group that would be tentatively named the "Society for Public Domain Excellence." It would be comprised of a large number of programmers that would work in groups or separately on a dozen or so projects. The projects would be programs that would have the most needed functions along with a professional look—case in point: a few friends of mine and I are currently working on a PD terminal program for the 128 that would (hopefully) rival the commercial program, Bobsterm Pro 128. When completed, it would have most of the options included in the Bobsterm package as well as many of the functions that people usually have to switch terms for, like emulations, color/graphics capability, reliable 2400 baud, and the largest selections of protocols we can come up with (including developing a Ymodem protocal for the 128).

In the development of these programs, not only the current selections available for the Commodore will be taken into account, but also those of other machines, including IBM and Amiga. In other words, we would pack as many of the features of programs in the same application as possible into the C-128's memory.

A few months ago I posted a note on USENET asking for suggestions or perspective participants; I received virtually no feedback at all. So I am turning to you and the distribution of your column for help. I am looking for anyone who feels that they are relatively proficient in programming in BASIC, machine language, or any other language on the 128. Also I would appreciate and encourage any suggestions whatsoever on how to handle such a task as this. I've been thinking about perhaps doing it by US mail or even a common online meeting place if at all possible.

I want to thank you and your readers in advance for your time.

Brendan Kehoe

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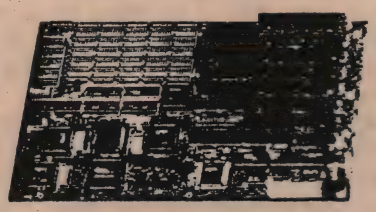

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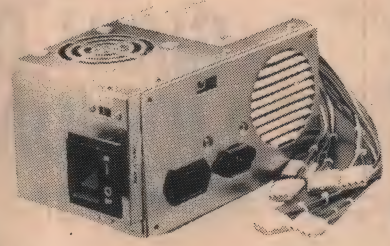

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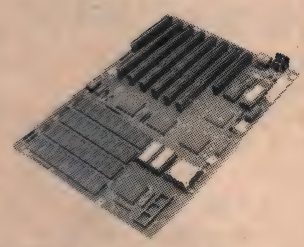

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Digiscape Software Announces The Release Of Digital Landscape

Digital Landscape is a software package for the Commodore 64 and 128 which lets the user view in 3-D the topography of any area of the U.S. excluding Alaska and Hawaii. To view in 3-D an area of the U.S., data may be entered either from a topographic map or from one of the Elevation Disks available from Digiscape Software. The program requires a Commodore 64 or 128 computer, a 1541, 1571 or 1581 disk drive, and a dot matrix printer if hard copy is desired.

Digital Landscape uses data from the Elevation Disks or data entered through the keyboard to produce 3-D renderings and horizontal or vertical cross-sections on the screen with pertinent information displayed. 3-D renderings may be rotated 360 degrees in one degree increments in azimuth and tilted from +1 degree to +89 degrees in declination. Renderings may be saved to disk for later retrieval. The scale of 3-D renderings may be varied and vertical cross-sections may be expanded and contracted vertically or horizontally.

Digital Landscape Elevation Disks contain 414,400 elevations taken at regular intervals across the U.S. These elevations are contained in 518 map files. There are available five 5¼" Elevation Disk sets covering the conterminous U.S. and parts of Canada and Mexico or three 1581 disks covering the same area. Each 5¼" Elevation Disk set contains 2 or 3 disks and costs $29.95. All five 5¼" Elevation Disk sets may be purchased together for $99.95. Elevation Disks are also available on three 1581 disks and cost $27.95 per disk.

The program is on disk, menu driven, and supports a variety of printers. The price of the Digital Landscape program disk which is available on a 5¼" disk or 1581 disk is $46.95.

For additional information contact Digiscape Software, P.O. Box 113058, Carrollton, TX 75011-3058; (214) 241-9891. ●

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CP/M Column
continued from page 477

Well Brendan, I commend your idea, but I doubt how successful you will be. Perhaps I can give you one person's perspective on such a project. About seven years ago, we bought our first computer. At that time, my husband wanted to learn a little bit about programming. He had a solid background in electronics, but no practical experience with software. He started out using the modem to download a few PD programs, bought some books on programming and analyzed the programs he had downloaded. He modified one of them to make better use of one of the expanded features of our printer. This ended up being used to create very attractive labels for the disks distributed by our user group library and it is still available through FOG.

From there he proceeded to write a few small programs of his own; nothing fancy. All this while maintaining his old, relatively low-income high-frustration job.

Eventually, he and a friend decided to go into the software business. They sat down to write a program on the Macintosh. Almost four years later (and two years after they started marketing the product) they are still modifying and improving it. (No, they are not fixing bugs anymore.)

Early last year, they both took a trip out to California and decided to try their luck at finding jobs as programmers. Each found a full-time job paying twice their former income within two weeks. They are both now happily working at Apple doing Macintosh programming.

This is not an isolated story. It is a fairly common one and it's one reason that public domain software remains in its current state. When you get good enough to write acceptable public domain programs, you are awfully close to being employable as a programmer. Once you get a job doing programming for a living, it is difficult to find the time or inclination to write for the public domain.

So most of the public domain software is created or modified by those who are just learning to program. For sure, there are exceptions, like those who program on mainframes and consider playing around with their micros to be just a hobby. But for the most part, a decent programmer quickly outgrows the public domain. Shareware was one of the first indications of this phenomenon.

I commend you for your idea, but I suspect that the lure of the commercial marketplace will make it difficult for you to achieve your goal. Best of luck! I have your letter and your address here and I will forward any responses that I get to you. ●

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More Timex Sinclair

by Michael O'Brien

During the last two months, I have gone through more changes than Sherlock Holmes. Mostly "time changes," but these wandering feet are happy to be back on American soil. Anyway, back from Europe and ready to dance through this month's article with all the charm of a late night 1-900 number.

I arrived home to Anderson, Indiana just in time for two major events. The breaking here of the Indianapolis Colts training camp, and the Third Annual Timex-Sinclair-Amstrad computer users 1988 Midwest Regional Conference.

The conference occurred August 26th and 27th in beautiful Lakewood, Ohio. Lakewood is as close to Cleveland, as two keys on a TS/2068 keyboard. This years conference was sponsored by the Greater Cleveland Sinclair Users Group, presided over by Andy Kosiorek.

Beautiful, sunny weather reigned over the opening Saturday at the Beck Center for the Arts. The Beck Center, which opened in 1976, was a stunning location for the event. It features a skylit second floor display area for exhibitors, and two theatres; 100 and 500 seats respectively.

Initially, all advance publicity was directed primarily to New England, Canada, Ohio, Pennsylvania, Michigan and most points within a twelve hour driving radius. Surprising, the two hundred and fifty- plus that attended, often traveled in excess of that distance.

Dealers in attendance of this years regional gala included: Zebra Systems, Sharpes, The Syncware Group, Video Technologies, Quantum Levels, Budget Robotics, Promiseland Electronics. A+ Computer Response, Time Designs, Brice Road Pharmacy, Cuyahago Valley Software, CATS, ITSUG, SATUG, and users groups from local areas like Western Pennsylvania. Andy Kosiorek echoed the sentiments of many, proclaiming the event a success.

continued on page 553

Legends Glamour Gossip

Blue Lion Software is pleased to introduce Ticket To Hollywood, a software adventure and simulation that takes you through eight decades of movie history and thousands of facts from the Silent Screen to the latest blockbusters.

Guided by six detailed 3-D maps, you explore the famous landmarks in Hollywood or follow the footsteps of your favorite stars. Track Bogie down Sunset Boulevard, see where the"Rat Pack" hung out or attend a premiere at Grauman's.

What superstar made her escort follow 2 paces behind her? Who was born Maurice Micklewhite? How many movies did Tracy and Hepburn make? You earn your stars by answering these and thousands of other questions. You can even quiz the "director" about your favorite movie or stars. Follow leads, gather clues and finally solve one of 25 mysteries. It's always different, every time you play.

"Hollywood has always had a special magical attraction," says Frieda Lekkerkerker, president of Blue Lion Software. "And with the dramatic increase of VCR use and access to cable television, movies—new and old—are more popular now than ever. Hollywood lore, whether fact or fiction, has become especially fascinating."

Ticket To Hollywood will be available for IBM PC, AT and compatibles (requires 128K, CGA/EGA or Hercules: $39.95), Apple IIe/c/gs (requires 128K: $39.95) and Commodore 64/128 ($29.95). In the fall, a special Apple IIgs edition will be available ($39.95) as well as a Macintosh version ($44.95).

For additional information contact Blue Lion Software, 90 Sherman Street, Cambridge, MA 02140; (617) 876-2500. ●

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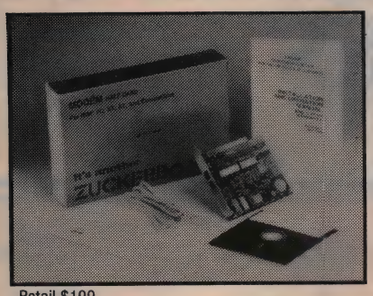

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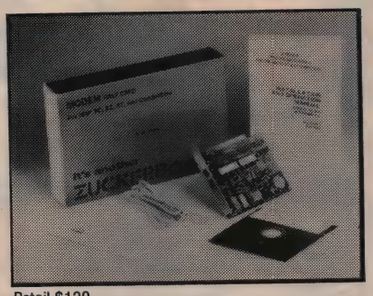

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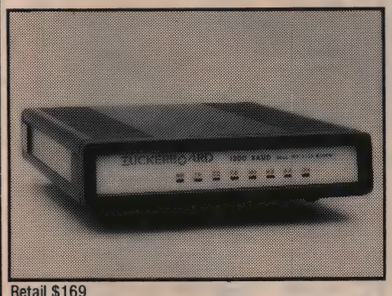

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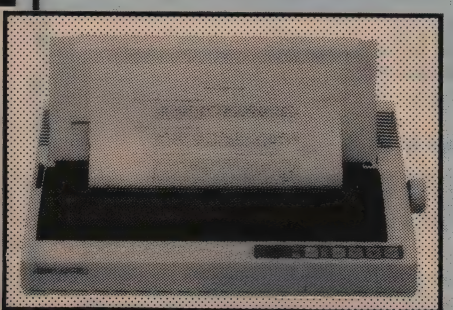

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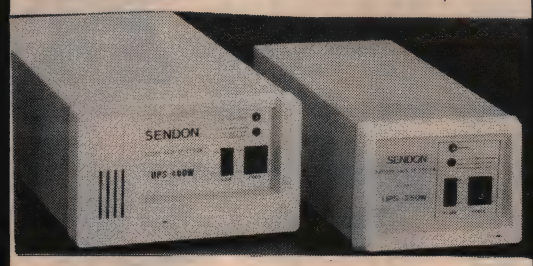

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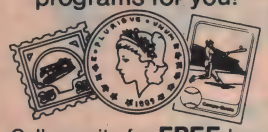

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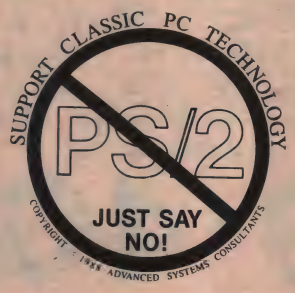

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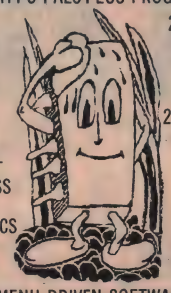

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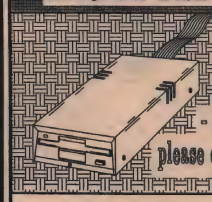

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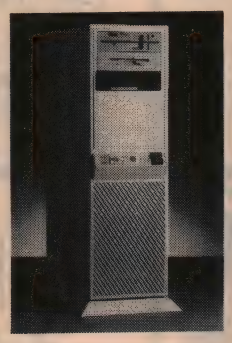

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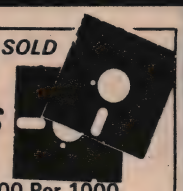

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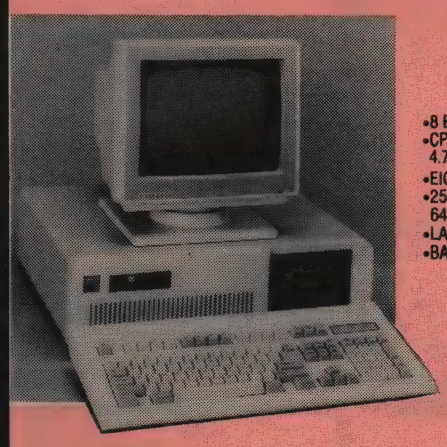

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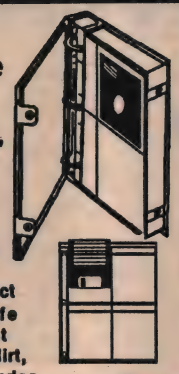

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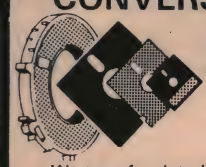

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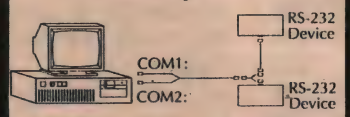

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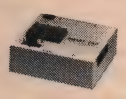

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	MF2DD ~	17.95	17.65	17.25
	MF2HD ~	39.95	39.00	37.75
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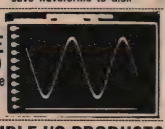

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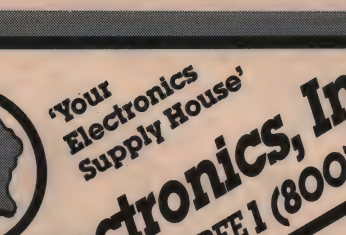

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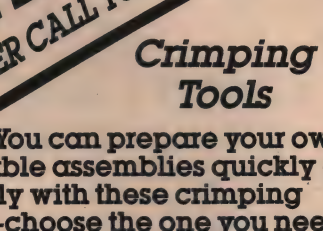

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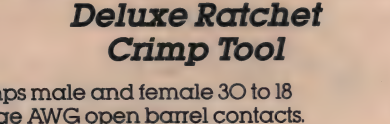

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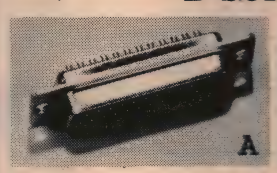

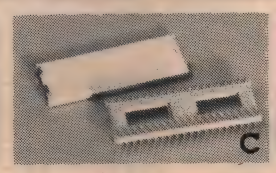

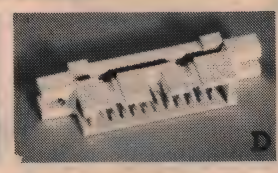

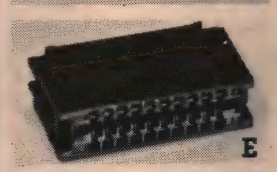

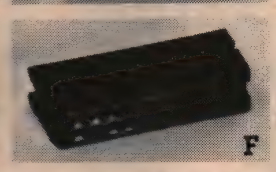

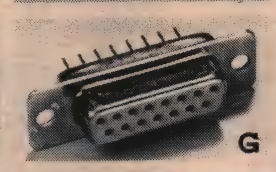

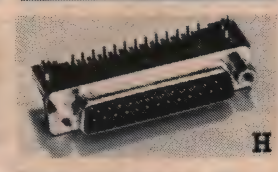

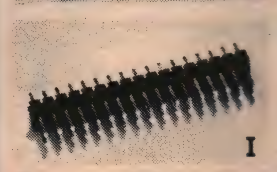

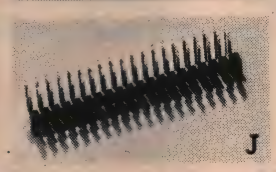

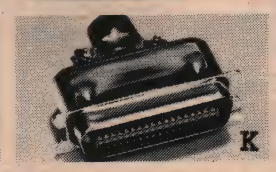

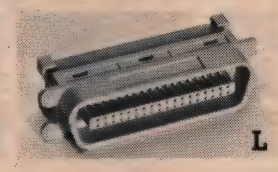

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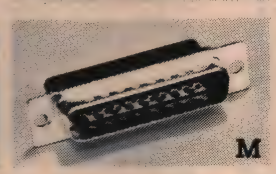

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15P	0.68	0.52	0.45
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37P	1.50	1.18	1.00
37S	1.50	1.18	1.00
50P	2.63	2.08	1.75
50S	2.75	2.18	1.83

B. Ribbon Cable Type

Part #	1-49	50-99	100-499
IDC9P	2.88	2.30	1.92
IDC9S	3.13	2.50	2.08
IDC15P	3.18	2.54	2.12
IDC15S	3.48	2.78	2.32
IDC25P	3.18	2.54	2.12
IDC25S	3.18	2.54	2.12
IDC37P	5.63	4.50	3.75
IDC37S	5.88	4.70	3.92

C. IDD Dip Plug Connector

Part #	1-49	50-99	100-499
IDD14	0.85	0.77	0.71
IDD16	0.95	0.86	0.79
IDD24	1.65	1.50	1.38
IDD40	2.75	2.50	2.29

D. IDP Plug Connector

Part #	1-49	50-99	100-499
IDP20P	4.95	4.50	3.95
IDP34P	5.95	5.50	4.95

E. IDE Edgecard Connector

Part #	1-49	50-99	100-499
IDE10	0.68	0.52	0.45
IDE20	0.75	0.58	0.50
IDE26	1.13	0.88	0.75
IDE34	1.40	1.10	0.93
IDE40	1.80	1.42	1.20
IDE50	2.10	1.66	1.40
IDE60	3.65	2.90	2.43

F. IDS Socket Connector

Part #	1-49	50-99	100-499
IDS10	0.80	0.62	0.53
IDS14	0.98	0.76	0.65
IDS16	0.98	0.76	0.65
IDS20	1.03	0.80	0.68
IDS26	1.20	0.94	0.80
IDS34	1.33	1.04	0.88
IDS40	1.80	1.42	1.20
IDS50	2.40	1.90	1.60
IDS60	2.90	2.30	1.93

G. PC Mount Straight

Part #	1-49	50-99	100-499
P9P	0.88	0.70	0.58
P9S	0.88	0.70	0.58
P15P	1.13	0.90	0.75
P15S	1.13	0.90	0.75
P25P	1.50	1.20	1.00
P25S	1.50	1.20	1.00
P37P	2.00	1.60	1.33
P37S	2.25	1.80	1.50

H. PC Mount Right Angle

Part #	1-49	50-99	100-499
R9P	1.03	0.82	0.68
R9S	1.03	0.82	0.68
R15P	1.38	1.10	0.92
R15S	1.38	1.10	0.92
R25P	1.88	1.50	1.25
R25S	1.88	1.50	1.25
R37P	2.23	1.78	1.48
R37S	2.23	1.78	1.48

I. Breakaway Header-Straight

	PRICE/QTY.		
Part #	1-49	50-99	100-499
IDH10B	0.31	0.27	0.25
IDH14B	0.43	0.38	0.35
IDH16B	0.49	0.44	0.40
IDH20B	0.61	0.55	0.50
IDH26B	0.80	0.71	0.65
IDH34B	1.04	0.93	0.85
IDH40B	1.22	1.09	1.00

J. Breakaway Header - Right Angle

	PRICE/QTY.		
Part #	1-49	50-99	100-499
IDH10BR	0.41	0.36	0.33
IDH14BR	0.57	0.51	0.47
IDH16BR	0.65	0.58	0.53
IDH20BR	0.82	0.73	0.67
IDH26BR	1.06	0.95	0.87
IDH34BR	1.39	1.24	1.13
IDH40BR	1.63	1.45	1.33

K. 57 Series Solder Type

Part #	1-49	50-99	100-499
5724P	2.15	1.70	1.43
5724S	2.65	2.10	1.77
5736P	2.15	1.70	1.43
5736S	2.65	2.10	1.77
5750P	2.90	2.30	1.93
5750S	2.90	2.30	1.93

L. 57 Series Ribbon Cable Type

Part #	1-49	50-99	100-499
ID5724P	5.00	4.10	3.43
ID5724S	5.63	4.60	3.85
ID5736P	2.90	2.42	2.03
ID5736S	3.15	2.62	2.20
ID5750P	6.60	5.38	4.50
ID5750S	7.03	5.72	4.78

M. Empty Crimp Shells

Part #	1-49	50-99	100-499
C9P	0.55	0.42	0.37
C9S	0.55	0.42	0.37
C15P	0.60	0.46	0.40
C15S	0.65	0.50	0.43
C25P	0.58	0.44	0.38
C25S	0.63	0.48	0.42
C37P	1.13	0.88	0.75
C37S	1.17	0.92	0.78
C50P	1.53	1.20	1.02
C50S	1.65	1.30	1.10

N. Crimp Contacts

Part #	1-99	100-999	1K-4999
CP20P	0.080	0.034	0.028
CP20S	0.100	0.040	0.033

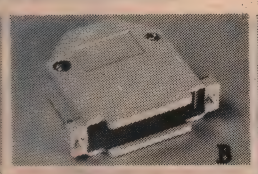
O. 2 Pin Shorting Blocks

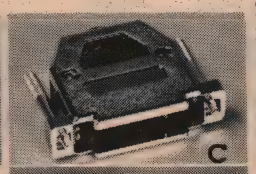
Part #	1-49	50-99	100-499
2PJ	0.25	0.15	0.10

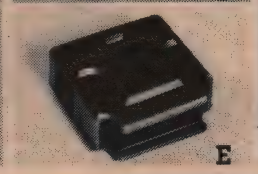
Call for more information!

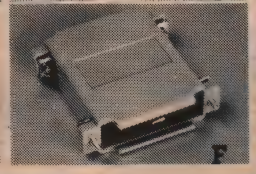
Hoods and Covers

These hoods and covers are available in plastic, shielded/metal (for EMI/RFI resistance) and with or without thumbscrews in a variety of sizes to house your particular shell connectors.









A. Shielded Plastic Hoods

Part #	1-49	50-99	100-499
SH9	0.68	0.52	0.45
SH15	0.73	0.56	0.48
SH25	0.75	0.58	0.50
SH37	1.33	1.04	0.88
SH50	1.60	1.26	1.07

B. Grey Plastic Hoods

Part #	1-49	50-99	100-499
GH9	0.60	0.46	0.40
GH15	0.60	0.46	0.40
GH25	0.60	0.46	0.40
GH37	0.93	0.72	0.62
GH50	0.98	0.76	0.65

C. Hoods w/Thumbscrews

Part #	1-49	50-99	100-499
GH-25TS	1.30	1.10	0.90
SH-25TS	0.80	1.22	0.95

D. Metal Hoods

Part #	1-49	50-99	100-499
MH9	1.75	1.60	1.33
MH15	1.95	1.72	1.43
MH25	1.95	1.72	1.43

E. Universal Hoods

Part #	1-49	50-99	100-499
SRH-9	0.88	0.68	0.58
SRH-15	0.90	0.70	0.60
SRH-25	0.90	0.70	0.60

F. Gender Changer Hoods

GCH9	for 9 pin connectors		
GCH15	for 15 pin connectors		
GCH25	for 25 pin connectors		
1-49	50-99	100-499	
0.80	0.62	0.53	
0.95	0.74	0.63	
0.95	0.74	0.63	

Call For More Information!

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Terms: Minimum order $10.00. We accept Mastercard, VISA and American Express at no additional charge. For C.O.D. orders, add $2.00. For orders under $100.00, add $3.00 handling and actual UPS shipping charges. For orders over $100.00, we pay handling charge–you pay actual UPS shipping charges plus insurance. Purchase orders accepted from approved accounts. All returns require an RMA# and are subject to a restocking fee. Texas residents add 7.5% sales tax. Prices subject to change and we are not responsible for typographical errors.

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At Altex Electronics, Inc., we carry a large supply of pre-assembled cables in assorted lengths for a variety of applications. Don't see what you need? Call our cable department — we'll be glad to build a custom cable or cables to your specifications.

A. PC/AT Parallel Printer Cables

Stock #	Length	Price
PPC301-6	6 ft.	$ 6.95
PPC301-10	10 ft.	7.95
PPC301-15	15 ft.	11.95
PPC301-25	25 ft.	17.95
PPC301-6RA	6 ft.	12.95

B. Diablo 630 Parallel Printer Cable

Stock #	Length	Price
PPC301-6D	6 ft.	$14.95

C. Radio Shack Parallel Printer Cables

Stock #	Length	Price
PPC304	6 ft.	$ 9.95
PPC305	15 ft.	12.95

D. Centronics 36 Pin Cables Male-Male

Stock #	Length	Price
36MM-6	6 ft.	$ 7.95
36MM-10	10 ft.	9.95

E. DB-25 - 25 Line Cables Male-Male

Stock #	Length	Price
25MM-6	6 ft.	$ 6.95
25MM-10	10 ft.	7.95
25MM-25	25 ft.	17.95
25MM-50	50 ft.	33.95
25MM-100	100 ft.	62.95

F. DB-25 - 25 Line Cables Male-Female

Stock #	Length	Price
25MF-6	6 ft.	$ 6.95
25MF-10	10 ft.	7.95
25MF-25	25 ft.	17.95
25MF-50	50 ft.	33.95
25MF-100	100 ft.	62.95

G. DE-9 - 9 Line Cables Male-Male

Stock #	Length	Price
9MM-6	6 ft.	$ 5.95
9MM-10	10 ft.	9.95
9MM-25	25 ft.	14.95
9MM-50	50 ft.	22.45
9MM-100	100 ft.	37.45

Cable Assemblies

H. DE-9 9 Line Cables Male-Female

Stock #	Length	Price
9MF-6	6 ft.	$ 5.95
9MF-10	10 ft.	9.95
9MF-25	25 ft.	14.95
9MF-50	50 ft.	22.45
9MF-100	100 ft.	37.45

I. IEEE-488 Cables

Stock #	Length	Price
488-1	1 Meter	$39.95
488-2	2 Meter	43.95
488-4	4 Meter	49.95

Modem Cables

Stock #	Description	Price
J. XTM-6	PC/XT to modem (6 ft.)	$ 6.95
ATM-1	AT to modem (1 ft.)	4.95
ATM-6	AT to modem (6 ft.)	6.95
JRM-6	PC Jr. to modem (6 ft.)	16.50

Apple Cable Assemblies

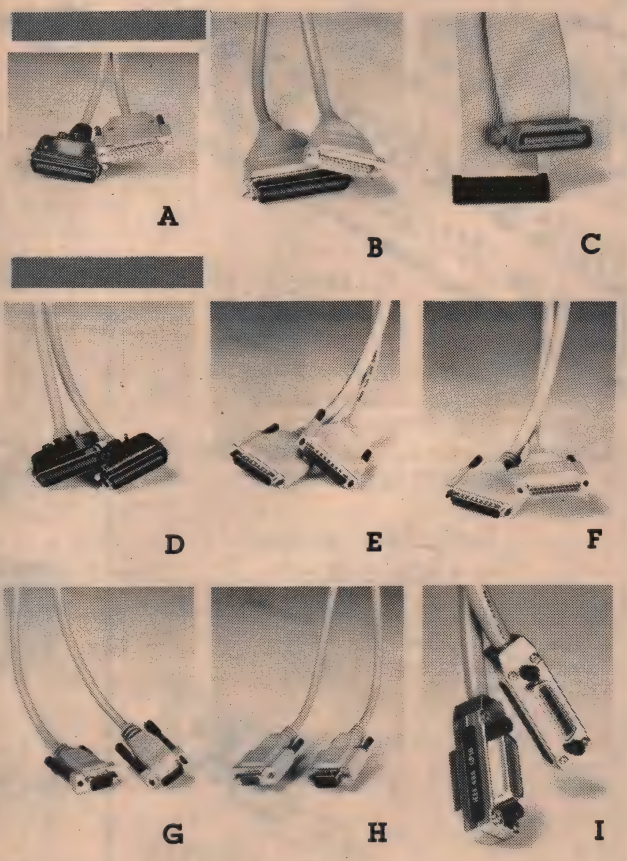
Stock #	Description	Price
AC-1	MAC512 to image II	$ 8.95
AC-2	IIe to Image II	8.95
AC-3	IIe to Image II	8.95
K. AC-4	MAC + to Image II	8.95
AC-5	MAC + to 9 pin MAC adapter	8.95
L. AC-6	MAC + to Hayes Modem	8.95
AC-7	8 pin mini din to open end	8.95
AC-8	MAC512 to Hayes Modem	8.95
AC-9	IIc to Hayes Modem	8.95
AC-10	IIe to Hayes Modem	8.95
SCSI-HD	MAC + to SCSI Disk	9.95
SCSI-DC	SCSI Daisy Chain Cable	11.95
SCSI-EC6	SCSI 6 ft. Extension Cable	16.95

Drive Cable Assemblies

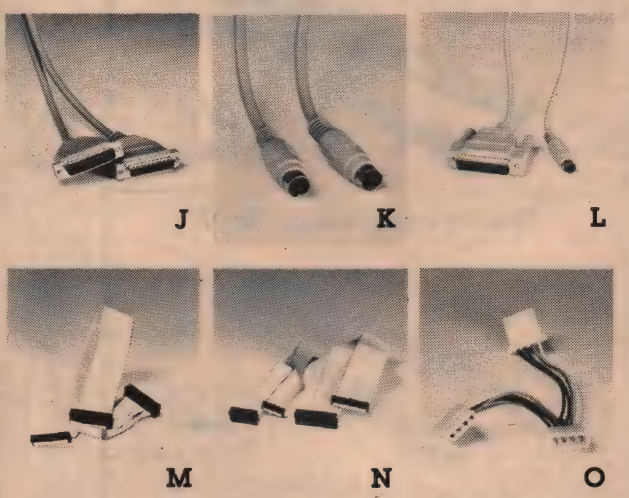
Stock #	Description	Price
M. DFC-XTS	XT dual floppy cable (34S-34E-twist-34E)	$ 4.95
DFC-XTE	XT dual floppy cable (34E-34E-twist-34E)	4.95
N. HDC-XT	Hard drive cable set XT (20S-20E and 34S-34E)	4.95
HFDC-AT	AT hard and floppy drive cable set	9.95
2HDC-22	Dual hard drive cable set	11.95
DFCEX-XT	Ext. floppy cable (37P-34E-twist-34E)	12.50
O. YAD-4	Drive power 'Y' adapter	2.50
TEXD-4	Toshiba Laptop ext. disk drive cable	16.95

Ask about quantity pricing!

Custom cable technical HOTLINE: 1 (512) 366-4081



At Altex Electronics, Inc., you'll find a virtually limitless supply source of hard-to-find cables, connectors, computer accessories and electronic components—just to name a few.

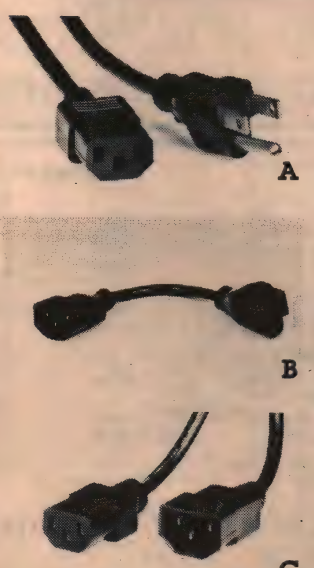


Popular PC Cable Assemblies

Whether your needs are extending an existing system or replacing cables in it, these quality pre-assembled cables can do the job effectively and economically.

Stock #	Description	Price
A. KEC-6	Keyboard ext. cable 6 ft.	$3.95
B. MEC-6	Monitor ext. cable 6 ft.	5.95
C. PS2-MEC6	PS-2 monitor ext. cable 6 ft.	14.95
D. 9P-RCA	9 pin male to RCA plug 6 ft.	6.95
E. RGB-6	RGB cable, 9 male to 8 pin rect.	6.95
F. VMC-10	Video monitor cable, RCA to RCA	2.50

Power Cables



These are ideal for use as replacement cables.

Stock #	Description	Price
A. ACPC-02	PC power cord	$3.95
B. ACPC-03	PC power adapter cable	4.95
C. ACPC-04	Monitor power extension cable (6 ft.)	5.50

We also carry SURGE PROTECTION outlet strips! Call!

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Coaxial Connectors

Complete and attach or extend your coaxial cables with these high-quality connectors and adapters. They are available in RG-58, RG-59 and RG-62 types and come complete with the necessary pins and crimp rings where applicable. The BNC connectors are available in solder, crimp and twist-on styles, the TNC connectors are available in crimp or twist-on styles and the TWIN-AX connectors are available in the solder style. Adapters and terminators of different ohms are also available in each connector. **58 = RG58 59 = RG59 or RG62**

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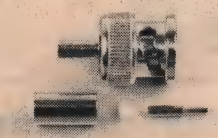
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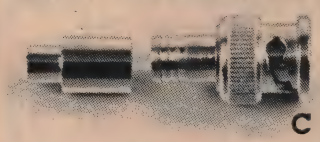
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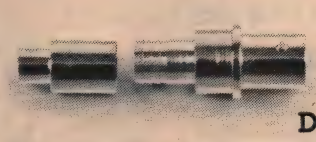
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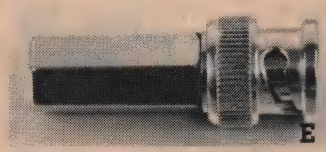
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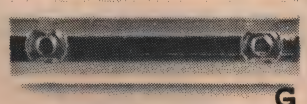
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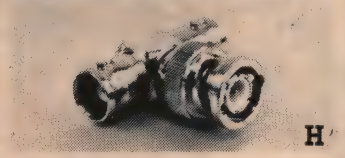
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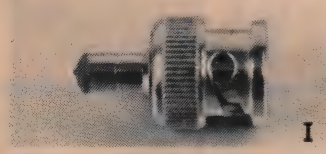
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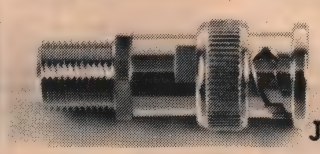
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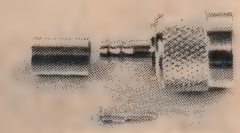
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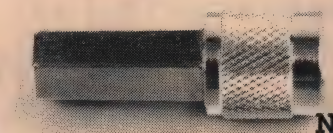
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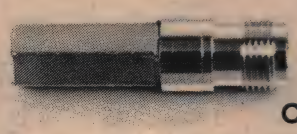
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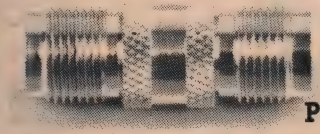
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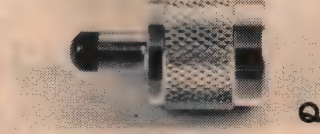
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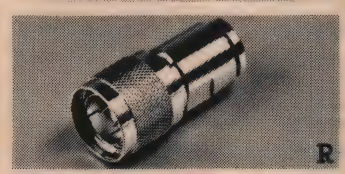
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A. BNC Male Solder Type

		1-24	25-49	50+
9021	for RG-58	1.43	1.27	1.17
9020	for RG-59 or 62	1.43	1.27	1.17
9025	for RG-59 or 62 teflon	2.45	2.18	2.00

B. BNC Male Crimp Type - 3 Pc.

		1-24	25-49	50+
9101	for RG-58	1.33	1.18	1.08
9100	for RG-59 or 62	1.12	1.00	0.92
9103	for teflon-plenum cable	1.33	1.18	1.08

C. BNC Male Crimp Type - 2 Pc.

		1-24	25-49	50+
9001	for RG-58	1.53	1.36	1.25
9000	for RG-59 or 62	1.53	1.36	1.25
9009	for RG-59 or 62 teflon	1.53	1.36	1.25

D. BNC Female Crimp Type - 2 Pc.

		1-24	25-49	50+
9014	for RG-58	1.63	1.45	1.33
9003	for RG-59 or 62	1.63	1.45	1.33
9015	for RG-59 or 62 teflon	1.63	1.45	1.33

E. BNC Male Twist On Type

		1-24	25-49	50+
9051	for RG-58	1.43	1.27	1.17
9050	for RG-59 or 62	1.33	1.18	1.08
9054	for RG-59 or 62 teflon	1.53	1.36	1.25

F. BNC Female Twist On Type

		1-24	25-49	50+
9031	for RG-58	2.45	2.18	2.00
9053	for RG-59 or 62	1.84	1.64	1.50
9033	for RG-59 or 62 teflon	2.45	2.18	2.00

G. BNC Adapters

		1-24	25-49	50+
7430	female splice	1.43	1.27	1.17
8130	male splice	2.24	2.00	1.83
8470	chassis mount feed thru	3.06	2.73	2.50
8460	bulkhead receptical	0.92	0.82	0.75
8150	right angle	3.67	3.27	3.00

H. BNC "T" Type Connectors

		1-24	25-49	50+
8140	2 female 1 male	3.06	2.73	2.50
8141	all female	3.06	2.73	2.50
8142	all male	5.71	5.09	4.67

I. BNC Terminators

		1-24	25-49	50+
9008	50 ohm	2.45	2.18	2.00
9007	75 ohm	2.45	2.18	2.00
9093	93 ohm	2.45	2.18	2.00

J. BNC Adapters Misc.

		1-24	25-49	50+
7500	F female to BNC male	1.43	1.27	1.17
8100	BNC female to F male	1.84	1.64	1.50
7510	RCA female to BNC male	1.33	1.18	1.08
8110	BNC female to RCA male	1.84	1.64	1.50
8120	BNC female to UHF male	2.04	1.82	1.67
7420	UHF female to BNC male	2.04	1.82	1.67

K. TNC Male Crimp Type - 2 Pc.

		1-24	25-49	50+
9078	for RG-58	2.04	1.82	1.67
9077	for RG-59 or 62	2.04	1.82	1.67
9079	for RG-59 or 62 Teflon	2.04	1.82	1.67

L. TNC Male Crimp Type - 3 Pc.

		1-24	25-49	50+
9061	for RG-58	1.84	1.64	1.50
9060	for RG-59	184	1.64	1.50

M. TNC Female Crimp Type - 2 Pc.

		1-24	25-49	50+
9046	for RG-58	1.84	1.64	1.50
9047	for RG-59 or 62	1.84	1.64	1.50
9048	for RG-59 or 62 Teflon	1.84	1.64	1.50

N. TNC Male Twist On Type - 1 Pc.

		1-24	25-49	50+
9071	for RG-58	1.84	1.64	1.50
9070	for RG-59 or 62	1.84	1.64	1.50
9074	for RG-59 or 62 Teflon	1.84	1.64	1.50

O. TNC Female Twist On Type - 1 Pc.

		1-24	25-49	50+
9040	for RG-58	1.84	1.64	1.50
9041	for RG-59 or 62	1.84	1.64	1.50
9042	for RG-59 or 62 Teflon	1.84	1.64	1.50

P. TNC Adapters

		1-24	25-49	50+
9069	female splice	2.04	1.82	1.67
9067	chassis mount feed thru	3.27	2.91	2.67
9068	right angle	5.10	4.55	4.17

Q. TNC Terminators

		1-24	25-49	50+
9017	50 ohm	2.45	2.18	2.00
9018	75 ohm	2.45	2.18	2.00

R. Twinax Connectors

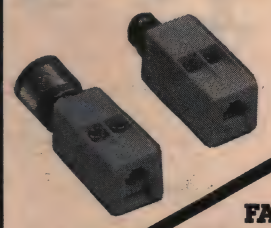
		1-24	25-49	50+
9080	male	4.59	4.09	3.75
9081	female splice	4.59	4.09	3.75
9083	chassis mount feed thru	6.53	5.82	5.33
9085	T-connector all female	8.67	7.73	7.08
9086	100 ohm terminator	8.16	7.27	6.67

Baluns

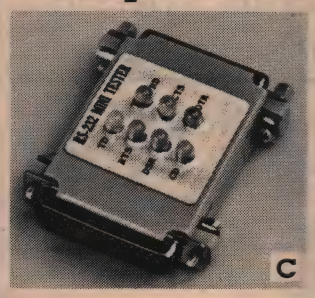
Save money and simplify installation with these baluns. The baluns allow you to use inexpensive twisted pair or modular telephone cable instead of cumbersome, expensive coaxial cable for data transmission.

Stk#	Description
BLO1	Male BNC to modular RJ-11 and screw terminals.
BLO5	Male Twin-ax to modular RJ-11 and screw terminals.
BLO8	BNC-TNC Wang balun

Stk#	Price 1-49	50-99	100-Up
BLO1	$ 9.00	7.50	6.00
BLO5	15.00	11.25	9.00
BLO8	28.00	25.45	20.00



Adapters and Problem Solvers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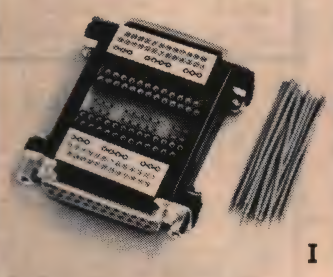
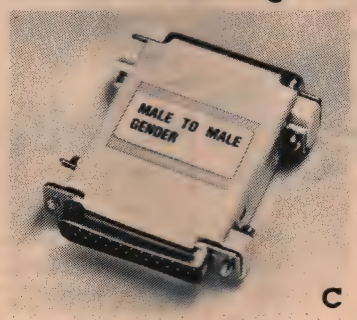

I

Establish a communications link, make a custom interface, monitor your data signal, troubleshoot, add surge protection and more with this variety of adapters and problem solvers for your different applications.

Stock #	Description	Price
A. NMA-25	Null Modem Adapter - (inline)	$ 4.95
B. MPB-25	Mini Patch Box (solder type)	8.95
C. MTT-25	Mini Tester (7 LED's)	8.95
D. AT-SCA	AT Serial Cable Adapter	7.95
E. PC-SCA	PC Serial Cable Adapter	7.95
F. SPP-25	RS-232 DB-25 Surge Suppressor	8.95
G. MSP-232	Modem Surge Protector	12.95
H. BRB-232	RS-232 Breakout Box	39.95
I. MWD-232	DB-25 Wiring Device (solderless)	8.95

Gender Changers



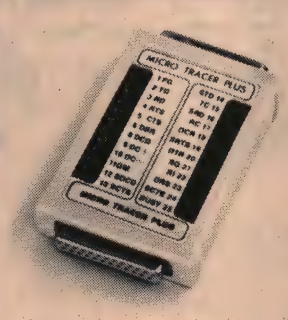
C

These gender changers provide an inexpensive way of mating like connectors quickly and easily.

They are available in 9, 25 and 36 pin configurations.

Stock #	Description	Price
A. AGC-9M	9 Pin male to male	$3.95
B. AGC-9F	9 Pin female to female	3.95
C. AGC-25M	25 Pin male to male	3.95
D. AGC-25F	25 Pin female to female	3.95
E. AGC-36M	36 Pin male to male	6.95
F. AGC-36F	36 Pin female to female	6.95

Micro Tracer



This micro tracer monitors all RS-232I/O data lines.

It installs easily in line with its male to female DB25 connectors.

MT-232 **$39.95**

Call For More Information!

FAX 1 (512) 344-2985

Terms: Minimum order $10.00. We accept Mastercard, VISA and American Express at no additional charge. For C.O.D. orders, add $2.00. For orders under $100.00, add $3.00 handling and actual UPS shipping charges. For orders over $100.00, we pay handling charge-you pay actual UPS shipping charges plus insurance. Purchase orders accepted from approved accounts. All returns require an RMA# and are subject to a restocking fee. Texas residents add 7.5% sales tax. Prices subject to change and we are not responsible for typographical errors.

Store Hours: 8:00-6:00 M-F, 10:00-2:00 SAT CST
10731 Gulfdale, San Antonio, TX 78216

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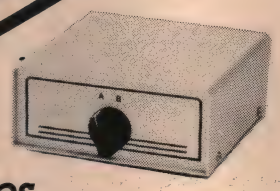
Data Switchboxes



Move from one device to another with a turn of a knob! These switchboxes allow you to share computers, printers and other peripherals quickly and easily. We stock a complete line of switchboxes with several switching arrangements and connections to accommodate different systems and applications. All switchboxes feature sturdy metal construction, rotary switches with gold plated contacts to insure maximum reliability and are EMI-RFI protected.

A. DB-25 25 Line Switchboxes

Stock #	Description	Price
AB25-2	Two position	$19.95
AB25-3	Three position	25.95
AB25-4	Four position	28.95
AB25-5	Five position	38.95
AB25-6	Six position	59.95
AB25-X	Cross over	29.95

B. Centronics 36 Line Switchboxes

Stock #	Description	Price
AB36-2	Two position	$23.95
AB36-3	Three position	29.95
AB36-4	Four position	34.95
AB36-5	Five position	44.95
AB36-X	Cross over	37.95

C. DE-9 9 Line Switchboxes

Stock #	Description	Price
AB09-2	Two position	$19.95
AB09-4	Four position	34.95

E. DC-37 37 Line Switchboxes

Stock #	Description	Price
AB37-2	Two position	$24.95
AB37-4	Four position	44.95

F. BNC Switchboxes

Stock #	Description	Price
ABBN-2	Two position	$33.95
ABBN-4	Four position	43.95

H. Twinaxial Switchboxes

Stock #	Description	Price
ABTWX-2	Two position	$38.95
ABTWX-4	Four position	53.95

I. Monitor-Keyboard Switchbox

Stock #	Description	Price
ABMKB-2	Two position Five Pin Din & Nine Pin D-Sub	$58.95

J. 8 Pin Mini-Din Switchboxes

Stock #	Description	Price
ABMD8-2	Two position	$28.95
ABMD8-4	Four position	43.95
ABMD8-X	Cross over	53.95

K. IEEE-488 Switchboxes

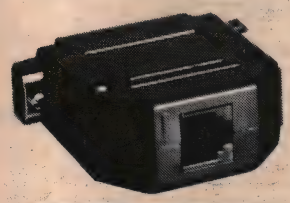
Stock #	Description	Price
AB24-2	Two position	$58.95
AB24-4	Four position	78.95

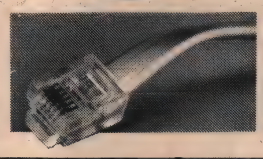
L. RJ-11 RJ-45 Switchboxes

Stock #	Description	Price
ABRJ11-2	Two position	$28.95
ABRJ11-4	Four position	43.95
ABRJ45-2	Two position	33.95
ABRJ45-4	Four position	48.95

Modular to RS-232 Adapter Kits

Use these modular adapter kits to change D-sub ports (RS-232) into 6 pin (RJ-11) or 8 pin (RJ-45) modular jacks. Simplifies installation of cabling used in networking and serial input/output devices. Use modular cable instead of RS-232 cables and relocate your equipment as easily as plugging in modular phones. Available in 9, 15, and 25 pin D-sub male or female versions. Easy to assemble—just insert pins into connector where desired—comes complete with all hardware.





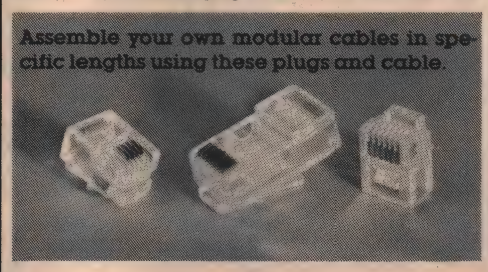
Stock #	Description	1-49	50-99	100-Up
MA9M-6	9 Male to RJ-11	3.00	2.40	2.00
MA9F-6	9 Female to RJ-11	3.00	2.40	2.00
MA15M-6	15 Male to RJ-11	3.50	2.80	2.33
MA15F-6	15 Female to RJ-11	3.50	2.80	2.33
MA25M-6	25 Male to RJ-11	3.00	2.40	2.00
MA25F-6	25 Female to RJ-11	3.00	2.40	2.00
MA9M-8	9 Male to RJ-45	3.50	2.80	2.33
MA9F-8	9 Female to RJ-45	3.50	2.80	2.33
MA15M-8	15 Male to RJ-45	4.00	3.20	2.67
MA15F-8	15 Female to RJ-45	4.00	3.20	2.67
MA25M-8	25 Male to RJ-45	3.50	2.80	2.33
MA25F-8	25 Female to RJ-45	3.50	2.80	2.33

Use these adapters with the modular plugs and cable (below) to make your own custom cable connections.

Modular Plugs and Cable

Telephone Modular Plugs

Stock #	Description	Ea.	100 Ea.	1000 Ea.
MP-4M	4 pin mini handset modular	0.20	0.15	0.11
MP-4	4 pin modular plug 4x6	0.20	0.15	0.11
MP-6	6 pin modular plug 6x6	0.25	0.15	0.14
MP-8	8 pin modular plug 8x8	0.30	0.22	0.17



Assemble your own modular cables in specific lengths using these plugs and cable.

Modular Cable

Stock #	Description	Per ft.	100 ft.	1000 ft.
MW4	4 Cond.	0.10	5.00	40.00
MW6	6 Cond.	0.15	8.00	65.00
MW8	8 Cond.	.25	10.00	83.00

Modular Crimping Tools

MCT-06

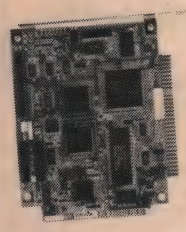
MCT-08

Stock #	Desc.	Ea.
MCT-06	Crimps 4 and 6 pin modular plugs	$12.50
MCT-08	Crimps 8 pin modular plugs	22.50

We carry many types of crimping tools—Call!

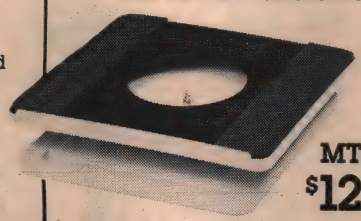
Computer Accessories

Computer Expansion Cards



- PC/XT RS-232 Serial Cord IFC-12 $29.95 w/2nd port $44.95
- PC/XT Clock Card IFC-19 $34.95
- PC/XT Parallel Printer Card IFC-13 $29.95
- PC/XT/AT Game Card IFC-20 $19.95
- PC/AT Serial-Parallel Card IFC-25 $59.95
- PC/XT Floppy Diskette Controller Card IFC-14 $29.95

Computer Monitor Tilt 'N Swivel Stand



MTS-12 $12.95

This stand rotates 360° and is tiltable ±12.5° to help reduce eyestrain and muscle fatigue caused by incorrect positioning of screen.

Computer Power Supplies (XT, AT)

These units offer dependable power and are available in both 150 watt XT compatible and 200 watt at compatible sizes.

PS-150	Power supply-150 watt (XT)	$49.95
PS-200	Power supply-200 watt (AT)	$99.95

Alkaline Computer Battery

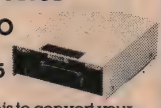
$9.95

Replace your old 6V lithium batteries with this 4.5 volt alkaline battery and get 25-45% more service life. For IBM PC, XT and AT compatibles.

Universal Interface Converter

UIC-100

$99.95



Use this to convert your data from serial to parallel or parallel to serial.

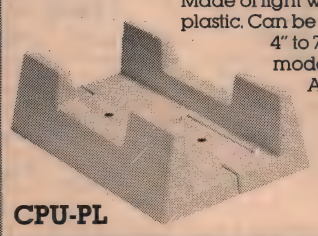
Computer Joystick

IBM/PC and Apple II, IIe compatible, this joystick features selectable 'spring-centering' or 'free-floating' function, electrical trim adjustments on both axis and 360° cursor control.

INP-10 $24.95

Universal Vertical CPU Stand

Made of light weight molded plastic. Can be adjusted from 4" to 7½" to accommodate PC/XT, PC/AT system units.



CPU-PL $11.95

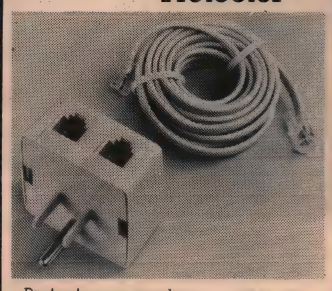
Computer Mouse Mat

Increase traction for a positive response and eliminate wear on your mouse with a Mouse Mat from Altex. Tough nylon top with neoprene backing to prevent slippage. It measures 10¾"W x 8⅞"D x 5/16"H.

$4.99

While They Last!

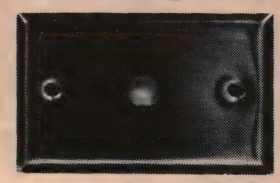
Modem Surge Protector



Protect your modem from spike and surge problems with this unit.

$12.95 MSP-232

RS-232, BNC, TWINAX Wallplates



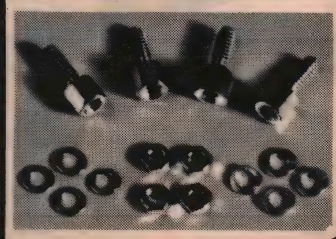
These stainless steel wallplates without connectors combine durability with an attractive finish to complete your cable installation.

Part #	Description	1-49	50-99	100-499
WP9-1	one slot stainless steel	1.75	1.40	1.17
WP9-2	two slot stainless steel	1.75	1.40	1.17
WP15-1	one slot stainless steel	1.75	1.40	1.17
WP15-2	two slot stainless steel	1.75	1.40	1.17
WP25-1	one slot stainless steel	1.75	1.40	1.17
WP25-2	two slot stainless steel	1.75	1.40	1.17
BNC-1	one hole stainless steel	1.75	1.40	1.17
BNC-2	two hole stainless steel	1.75	1.40	1.17

The BNC wallplate will hold TNC and F-connectors also.

D-Series Hardware

Use this hardware to complete assembly of D-series connectors.



Part #	Quantity 1-49	50-99	100-499
MDH-2	0.23	0.18	0.15
FDH-2	0.40	0.32	0.27
HEX-2	0.30	0.24	0.20

We carry many types of electronic hardware! Call!

FAX 1 (512) 344-2985

Terms: Minimum order $10.00. We accept Mastercard, VISA and American Express at no additional charge. For C.O.D. orders, add $2.00. For orders under $100.00, add $3.00 handling and actual UPS shipping charges. For orders over $100.00, we pay handling charge-you pay actual UPS shipping charges plus insurance. Purchase orders accepted from approved accounts. All returns require an RMA# and are subject to a restocking fee. Texas residents add 7.5% sales tax. Prices subject to change and we are not responsible for typographical errors.

Store Hours: 8:00-6:00 M-F, 10:00-2:00 SAT CST
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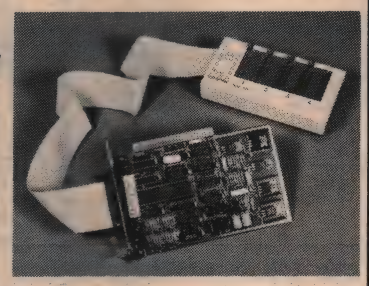
'Your Electronics Supply House'

Altex Electronics, Inc.

TO ORDER CALL TOLL FREE 1 (800) 531-5369

Eprom Programmers

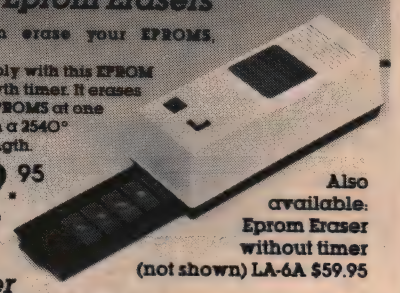
Now you can program your own EPROMS with this EPROM programmer. It can program up to 4, 16K thru 512K EPROMS simultaneously—easy to use software is included. We also carry a larger version (not shown) with the same quality features which can program up to 10 EPROMS at the same time.



Stock #	Description	Price
EW-904	4 gang EPROM programmer	$179.95
EW-910	10 gang EPROM programmer	399.95

Eprom Erasers

You can erase your EPROMS, quickly and simply with this EPROM ERASER with timer. It erases up to 9 EPROMS at one time with a 2540° wave length.

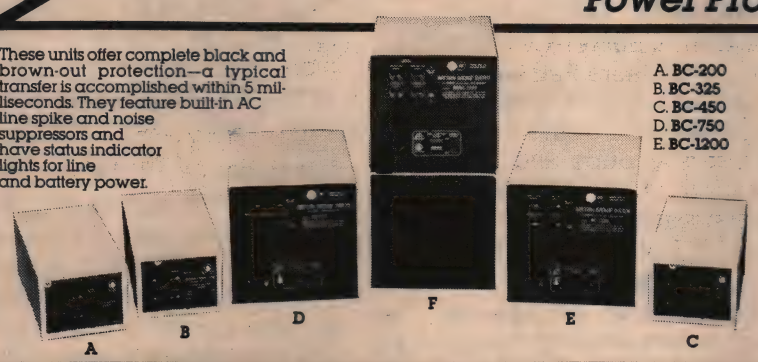


$79.95 LA-6T With Timer

Also available: Eprom Eraser without timer (not shown) LA-6A $59.95

Power Protection Devices

These units offer complete black and brown-out protection—a typical transfer is accomplished within 5 milliseconds. They feature built-in AC line spike and noise suppressors and have status indicator lights for line and battery power.



A.	BC-200	200 watt, 2 outlet	$239.00
B.	BC-325	325 watt, 4 outlet	299.00
C.	BC-450	450 watt, 4 outlet	399.00
D.	BC-750	750 watt, 4 outlet	599.00
E.	BC-1200	1200 watt, 4 outlet	799.00
F.	SC-BG-2000	2000 watt, 4 outlet	1,299.00

Tripplite™ Battery Backup Systems

Voltage Regulator–Line Stabilizer/Conditioners

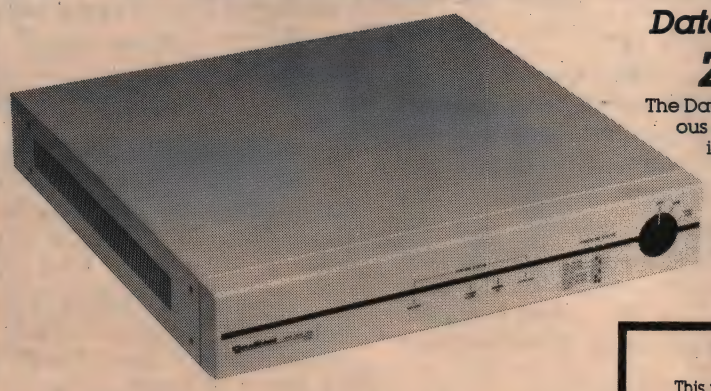
TrippLite™ Line Stabilizer/Conditioners automatically adjust varying input voltage to provide **full voltage support** during a low voltage condition while suppressing spikes and line noise.

A.	LS-600 600 watt, 5 Amp, 2 outlets	$79.00
B.	LC-1200 1200 watt, 10 Amp, 2 circuits/4 outlets	$149.00
C.	LC-1800 1800 watt, 15 Amp, 3 circuits/6 outlets	$199.00

Shown: LC-1200

Data Shield™ Solid State UPS

ZERO Transfer Time!



The DataShield SS400 and SS700 provide continuous uninterruptible power and line conditioning. They offer greater protection, more features, lighter weight (32 and 39 lbs.) and lower cost than any comparable UPS today. They effectively protect your equipment from brown and blackouts, voltage surge and spikes as well as RFI/EMI noise. Call for more information!

Stock No.	Description	Price
SS400	UPS-400VA (Approx. 350W)	$699.00
SS700	UPS-700VA (Approx. 600W)	839.00

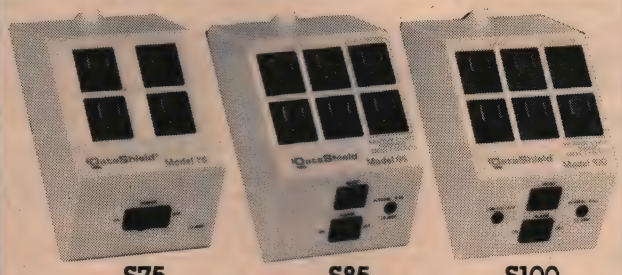
Turbo-2 Backups

Shown: T2-625A

The new second generation SPS DataShield Turbo 2 series feature a transfer time ***under*** 1 millisecond with regulated output, phase lock to AC line return, electronic overload protection and full surge and noise protection as well. DataShield offers three different Turbo units with ratings of 300, 450 or 625 W. Call for more information!

Stock No.	Description	Price
T2-300A	'Turbo 2' Series - 300W	$399.00
T2-450A	'Turbo 2' Series - 450W	439.00
T2-625A	'Turbo 2' Series - 625W	499.00

Super-Surge Noise Filters



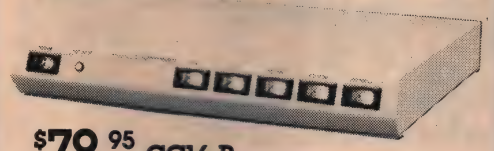
S75 S85 S100

These top-of-the-line 3-stage surge and noise protectors come with a lifetime protection warranty. They are rated #1 by PC Magazine.

A. S75	Surge protector, 4 socket	$45.00
B. S85	Surge protector, filters, 6 socket	59.00
C. S100	Surge protector, filters, alarm, 6 socket	69.00

TrippLite™ Power Director

This power director features four ISOBAR filtered outlets and one unswitched, unfiltered outlet. It also features complete RFI/EMI noise suppression for all your computer systems components.



$79.95 CC16-P

Data Shield™ Power Director

This power center has 5 swtiched outlets and includes such special features as noise protection, surge and spike protection, brown-out sensing and static control.

$99.00

PD-125

ISOBAR® AC Line Filters

Each power bar features multiple filters, spike and RFI/EMI noise protection and is available in 2, 4 and 8 outlet models.

IB2-0	2 outlet	$28.00
IB2-6	2 outlet	33.00
IB4-6	4 outlet	49.00
IB8-15	8 outlet	69.00

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Store Hours: 8:00-6:00 M-F, 10:00-2:00 SAT CST
10731 Gulfdale, San Antonio, TX 78216

Printer Ribbons

ORDER#	RIBBON	1-11	12-59	60-144	ORDER#	RIBBON	1-11	12-59	60-144
R423	C-ITOH 8510	2.98	2.48	2.13	R304	NEC P2200	6.84	5.70	4.89
R420	COM REX 420	11.74	9.78	8.39	R805	NEC P2	5.66	4.72	4.04
R533	EPSON ERC-03	3.64	3.03	2.60	R807	NEC P5	5.72	4.77	4.09
R530	EPSON MX70/80	4.34	3.62	3.10	R806	NEC P3/7	6.64	5.53	4.74
R534	EPSON LX80	2.84	2.37	2.03	R812NC	NEC3550	6.40	5.33	4.57
R532	EPSON MX100	5.24	4.37	3.74	R812MS	NEC3550 (MS)	4.80	4.00	3.43
R537	EPSON LQ1000	5.88	4.90	4.20	R830	OKI 82, 92, 83, 93	2.60	2.17	1.86
R531	EPSON LQ1500	4.50	3.75	3.21	R834	OKI 184	5.78	4.82	4.13
R539	EPSON LQ2500	5.84	4.87	4.17	R835	OKI 182, 192, 193	3.50	2.92	2.50
R538	EPSON EX800/1000	5.36	4.47	3.83	R293	OKI 293	8.14	6.78	5.81
R536	EPSON LQ800	4.80	4.00	3.43	R292	OKI 292	7.32	6.10	5.23
R425	IBM PP4201	5.08	4.23	3.63	R836	PAN 1080, 1090	3.98	3.32	2.84
R426	IBM PPXL4202	7.00	5.83	5.00	R837	PAN 1524	5.66	4.72	4.04
R045	IBM WHEELWRITER	6.10	5.08	4.36	R961	STAR NX10	5.72	4.77	4.09
R423	IMAGEWRITER	2.98	2.48	2.13	R967	STAR NX1000	5.48	4.57	3.91
R924	IMAGE II 4 COLOR	11.94	9.95	8.53	R556	TOSHIBA P341, P351, 1350	4.30	3.58	3.07
					R557	TOSHIBA 321SL	6.32	6.93	5.94

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Sun. Oct. 16th **Cherry Hill Computer Fair.** Days Inn Hotel, Rt. 73. Mt. Laurel, N.J. 150 Tables. Admission $4.50. Tables $45.00.

Sun. Nov. 6th **Eatontown Computer Fair.** Sheraton Eatontown, Intersection Rts. 35 and 35 Eatontown, N.J. 100 Tables. Admission $4.00. Tables $45.00.

POSTPONED

Sun. Nov. 6th **Hartford Area Computer Fair.** Ramada Hotel, I-91 and Bridge Street, East Windsor, Ct. 100 Tables. Admission $4.00. Tables $45.00. Under License to Wayne Cogan (203) 233-9922.

Sun. Nov. 13th **Pittsburgh Computer Fair.** Holiday Inn, McKnight Road, Pittsburgh, PA. 90 Tables. Admission $4.00. Tables $40.00.

Sun. Nov. 27th **Hanover Computer Fair.** Hanover Marriott Hotel, Rt. 10 East, 1 Mile West of I-287, near I-280, I-80, Hanover, N.J. 220 Tables. Admission $5.00. Tables $50.00.

Sun. Dec. 11th **Central Jersey Computer Fair.** Somerset Hilton Hotel, Exit 6 off I-287. 125 Tables. Admission $4.00. Tables $45.00.

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Sunday — Aspen Manor - Rte 46 West - I-80- Exit#47
10am-4pm — About 25 Minutes from George Washington Bridge

November 5 — **BOSTON SHOW - Woburn, MA - 400+ Tables**
Saturday — Northeast Trade Ctr. - Exit #35 of I-95 (Rte.128)
10am-4pm — Note: This is a revised show date! Biggest Show is Boston!

November 19 — **MARYLAND/DC/VA SHOW - 300+ Tables**
Saturday — Howard Johnson Plaza - New Carrollton, MD
10am-4pm — (formerly SHERATON) at Exit #20-B of I-95 Beltway

November 20 — **BALTIMORE, MD SHOW - 200 Vendor Tables**
SUNDAY — Holiday Inn - Timonium, MD - Near Fairgrounds
10am-3pm — I-83 Exit #16-A - Take I-695 Beltway to I-83 North

November 26 — **PHILADELPHIA - VALLEY FORGE - 450+Tables**
Saturday — Valley Forge Conv. Center-King of Prussia,PA
10am-4pm — Exit #24 PA TPKE - First Right - 1 mile on Right

December 11 — **BOSTON - BOXBOROUGH, MA - 225 TABLES**
SUNDAY — Sheraton Hotel - Special "Christmas Show"
10am-4pm — Exit #28 of I-495 at Rte. 111 - West of Boston

December 17 — **NO. NEW JERSEY - Wayne, NJ - 400 Tables**
Saturday — William Paterson College - SPECIAL "Christmas Show"
10am-4pm — Rte 46 or I-80 to Rte. 23 No. to Ratzer Rd.-5mi ahead

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11-88

Coming Events

If you know of or have a trade show, swap meet or club meeting connected with the computer field, we'll run an announcement in the COMING EVENTS section FREE of charge.

November 1988

November 5, 1988

The South Eastern Washington Computer Users Fair will be held at the Red Lion Motor Inn in Pasco, WA. The focus of the Fair will be on Users Groups and home application of all makes of computers. Admission to the general public is free. Merchants and vendors will show new equipment and software as space permits. For more information contact: Dean Scott (509) 735-6110 after 6:30 pm.

November 6, 1988

Columbus (Ohio) Kompufest '88 Computer Show & Sale will be held at the Ramada Inn North (I-71 exit Dublin-Granville Road) from 10 am-5 pm. Super savings on personal computer systems, software, peripherals, accessories & supplies. Raffle door prizes will take place during the show. $3.00 admission (children under 13 are free). For details, call Ben of Amerasia Group, Inc. at (317) 291-1706.

November 12, 1988

Computer Swap Meet. To be held at the Los Angeles County Fairgrounds (Building #5, Sycamore St.), 1101 McKinley Ave., Pomona, CA. Admission $5.00. For more information contact RK Productions, Inc., P.O. Box 18906, San Jose, CA 95158, (408) 978-7927, (800) 722-7927, in CA (800) 252-7927.

November 12, 1988

Computer Swap Meet. To be held at the Garden State Park (race track), Route 70 & Haddonfield Road, Cherry Hill, NJ. Admission $5.00. For more information contact RK Productions, Inc., P.O. Box 18906, San Jose, CA 95158, (408) 978-7927, (800) 722-7927, in CA (800) 252-7927.

November 13, 1988

The First Annual West Hartford, CT Christmas Computer User's Show, Sale and Flea Market. To be held from 10 am to 6 pm at the West Hartford Arena and Exhibit Center, 65 Dexter Ave., West Hartford, CT. Hardware, software, supplies and accessories, acres of patroled free parking. For more information call (203) 267-0445, Phoenix Enterprises, P.O. Box 834, Middletown, CT 06457.

November 13, 1988

Wooster, Ohio (Northeast Central Ohio). 2nd Annual N.E.C.O. Computer Fair & Flea Market will be held from 10 am to 4 pm at Triway Junior High School (on Ohio 226, 4 miles south of Wooster). $1.00 admission at the gate. N.E.C.O. Computer Fair is sponsored by Triway Academic Boosters, Country Computer Club, and the Triway MSDOS Users Group. (Advanced registration recommended.) For more information contact Maynard Yoh, 7177 Valley Road, Wooster, Ohio 44691. Free parking.

November 14-18, 1988

Comdex/Fall '88. The 10th National Fall Conference & Exposition for Independent Sales Organizations. To be held at the Las Vegas Convention Center & West Hall, Bally's Las Vegas, Caesars Palace, Las Vegas Hilton Hotel, Riviera Hotel, and Sahara Hotel, Las Vegas, NV.

November 15, 1988

The college of Education at Arizona State University will be hosting the ninth annual Microcomputers in Education Conference, March 6-8, 1989 on the University campus in Tempe, Arizona. Title of the conference is: Interactive Technology: Unlocking Education's Connection to the Future. The conference will emphasize practical educational applications as well as demonstrate an exciting future for technology in education. Deadline for applications to present concurrent sessions is November 15, 1988. For more information contact: Microcomputers in Education Conference, AMF-Community Services Center at Papago Park, Tempe, Arizona 85287-0908; 602-965-7363.

November 18-20, 1988

The Family Computer Center Show! To be held at the Holiday Inn (2nd floor), Tunelli Avenue, North Bergen, NJ (off of Rt. 3 East). The hours are Friday, 10 am-5 pm; Saturday, 10 am-6 pm; Sunday, 10 am-5 pm. For more information contact Home and Personal Computers of America, 154 Valley Street, South Orange, New Jersey 07079; (201) 763-3946.

November 19, 1988

Computer Swap Meet. To be held at the San Diego County Fairgrounds tentative (Bing Crosby Hall), 2260 Jimmy Durante Blvd., Del Mar, CA. Admission $5.00. For more information contact RK Productions, Inc., P.O. Box 18906, San Jose, CA 95158, (408) 978-7927, (800) 722-7927, in CA (800) 252-7927.

November 20, 1988

Computer Central—Chicagoland's Oldest & Largest Multi Vendor PC Bargain Expo. Adult admission is

$5.00. Located at Woodfield Hilton & Towers, 3400 Euclid Ave., Arlington Ballroom, Arlington Heights, IL (one block east of Route #53 on Euclid Ave.). Show hours are 9:30 am to 4:00 pm. For more information call (312) 940-7547.

November 27, 1988

The Hanover (New Jersey) Computer Fair returns to the Hanover Marriott Hotel. The hotel is located on Rt. 10E, near the intersections of I-80, I-280 and I-287, just 25 minutes from the George Washington Bridge. The show will be open to the public from 10 am to 4 pm and admission is $4.50. For more information, please call 201-533-1991.

December 1988

December 3, 1988

Computer Swap Meet. To be held at the Los Angeles County Fairgrounds (Building #5, Sycamore St.), 1101 McKinley Ave., Pomona, CA. Admission $5.00. For more information contact RK Productions, Inc., P.O. Box 18906, San Jose, CA 95158, (408) 978-7927, (800) 722-7927, in CA (800) 252-7927.

December 10, 1988

Computer Swap Meet. To be held at the Santa Clara County Fairgrounds, 344 Tully Road, San Jose, CA. Admission $5.00. For more information contact RK Productions, Inc., P.O. Box 18906, San Jose, CA 95158, (408) 978-7927, (800) 722-7927, in CA (800) 252-7927.

December 10, 1988

Computer Swap Meet. To be held at the Garden State Park (race track), Route 70 & Haddonfield Road, Cherry Hill, NJ. Admission $5.00. For more information contact RK Productions, Inc., P.O. Box 18906, San Jose, CA 95158, (408) 978-7927, (800) 722-7927, in CA (800) 252-7927.

December 11, 1988

Los Angeles, CA Kompufest '88 Computer Show & Sale will be held at the Ramada Hotel/Culver City (I-405 San Diego Fwy, off Centinela, near Foxhills Mall) from 10 am-5 pm. Super pre-Christmas bargain prices on personal computer systems, software, peripherals, accessories & supplies. Raffle door prizes will be given away during the show. Admission is $5.00 (children under 13 are free). For more information, call Ben at (317) 291-1706 or (213) 384-4206.

December 17, 1988

Computer Swap Meet. To be held at the San Diego County Fairgrounds tentative (Bing Crosby Hall), 2260 Jimmy Durante Blvd., Del Mar, CA. Admission $5.00. For more information contact RK Productions, Inc., P.O. Box 18906, San Jose, CA 95158, (408) 978-7927, (800) 722-7927, in CA (800) 252-7927.

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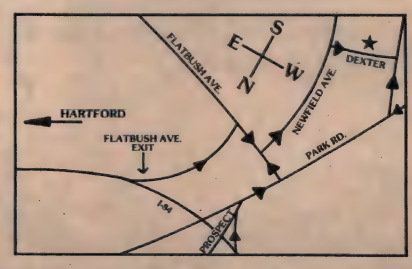

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- Both Friction & Tractor Feed
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- Paper Parking Feature
- High Resolution Graphics
- Multi-Font Selection
- Full One-Year Manufacturer's Warranty

Star NX-1000C Rainbow - Commodore Compatible - ~~$249~~

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NX-10C	Commodore Compatible	349	~~169~~
NX-1000	NEW Multi-Font Selection, 144 CPS, 4K, Paper Parking	299	~~179~~
NX-1000 Rainbow	Prints 7 Colors, Multiple Font Selection, 144 CPS	379	~~249~~
NX-1000C	Commodore Compatible, Multiple Font Selection, 144 CPS	299	~~179~~
NX-1000C Rainbow	Commodore Compatible, Prints 7 Colors, 144 CPS	379	~~249~~
LV-1215	120 CPS, IBM Compatible, 136 Column	499	~~199~~
LV-1615	160 CPS, IBM Compatible, 16K, 136 Column	699	~~239~~
LV-2015	200 CPS, IBM Compatible, 16K, 136 Column	799	~~299~~
SD-10	160 CPS, IBM/Apple Compatible, Parallel Interface	599	~~219~~
SD-15	160 CPS, IBM/Apple, 15" Carriage	749	~~249~~
SR-10	200 CPS, IBM Compatible, Parallel Interface	679	~~239~~
SR-15	200 CPS, IBM Compatible, 15" Carriage	799	~~299~~
NX-15	120 CPS + NLQ, Epson, IBM Comp., 15" Carriage	529	~~319~~
NR-10	240 CPS, Epson, IBM Comp., 12.6K Print Buffer	579	~~329~~
NR-15	240 CPS, Epson/IBM Comp., 12.6K, 15" Carriage	799	~~439~~
NB24-10	24-Pin, 180 CPS, Epson/IBM Compatible, 8K	749	~~449~~
NB24-15	24-Pin, 180 CPS, Epson/IBM Comp., 15" Carriage	999	~~559~~
NB-15	24-Pin, 300 CPS + LQ, Epson/IBM Comp., 15" Carriage	1399	~~595~~
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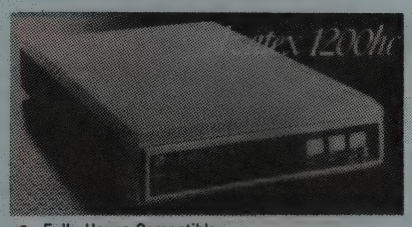
Avatex 1200hc External Modem



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- Complete Communications Software
- Auto Dial/Auto Answer
- On-Board Speaker
- 8 Front Panel LEDs, 3 Function Buttons
- Call Progress Detection
- Two Year Manufacturer's Warranty

Avatex 2400 External Modem

Impeccable transmission at twice the speed. Rtl. $269.

Your Price **$~~169~~** *Even Less*

- Fully Hayes Compatible
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- Auto Dial/Auto Answer
- COM Ports 1 & 2 Addressable
- On-Board Speaker
- Non-Volatile Memory for Phone No. Storage
- Two Year Manufacturer's Warranty

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C * SIX—NOTES

Networking

by Michael A. Banks

A Monthly Roundup Of What's New Online

Focus on C*SIX

Most of us are online to collect and exchange information of one sort or another, which is one reason why E-mail, Forum, and realtime Conference, are popular features in C*SIX. These features of C*SIX accommodate both public and private interchange.

These are not the only means of information interchange in C*SIX, however. There is the Poll area (described in the June, 1988 column), which functions as a two-way information interchange that you can use to collect opinions and other information from other members, as well as to put in your two cents' worth on topics of mutual interest to C*SIX members. Then there's the Announcements selection, which is a good source of information about events in the SIG and, on occasion, news from the world of computing.

Finding Out What's New In C*SIX: Announcements

As you've probably noticed in the past, "one-shot" announcements are occasionally displayed when you enter C*SIX, after the C*SIX logo and before the C*SIX menu. These are special messages called Briefs (no, not the kind you wear!) They're displayed to you only once, unless updated by the group manager.

Similar messages may pop up when you enter the Conference, Database, Forum, or Poll areas.

Ever wonder where those messages come from—or go? Did you miss something important the last time one scrolled by? Want to find out what else is new in the SIG? It's easy to reread these messages, and see others. Just type ANNOUNCEMENTS at the C*SIX menu. This selection leads you to the Announcements area and this category selection menu:

```
Announcements Menu:
What's New          Recent Software Changes
Conference News     Main Banner Display
Database News       Membership Agreement Display
Forum News          New Member Welcome Display
Poll News           Exit
ANNOUNCE>Which Announcement Category?
```

The selections on the left side of the menu lead to those Briefs. Select one of those topics, and you'll see an appropriate prompt (such as WHAT'S-NEW>). DELPHI will tell you how many announcements are available in this particular category. Type SCAN to see a directory of waiting messages, which will be similar to this sample:

```
Contents
 1  21-JUL   BRIEF HOW-TOS
 2  13-JUL   BRIEF KICKER 2
 3  29-APR   BRIEF MAIL ORDER SURVEY
 4  12-APR   BRIEF KICKER
 5  5-MAR    BRIEF CALL FOR FEEDBACK
 6  14-FEB   BRIEF TIMEX SINCLAIR
 7  29-JAN   BRIEF NEW TOPICS
 8  27-JAN   BRIEF CONFERENCE POLL
 9  26-DEC   BRIEF AD COMPLAINT
             PROCEDURE
WHAT'S-NEW>(Scan, Read, "?" or Exit):
```

To read a message, simply type its number. Press <RETURN> to see the message immediately following. (Type ? to see a menu of other choices.)

(The one-time Brief messages contain the word BRIEF in their titles. The What's-New category contains the Briefs that are displayed when you enter C*SIX.)

Of the selections on the right side of the category selection menu, all but one display specific announcements, then return you to the Announcements category selection menu. Thus, "Main Banner Display" displays the SIG's banner (the C*SIX logo and accompanying text); "Membership Agreement Display" displays the terms to which you agreed when you joined; and "New Member Welcome Display" displays the welcoming message you read when you first joined C*SIX.

"Recent Software Changes" leads to a self-directing database which you can search for information about new features in the SIG's operating software.

What's New On DELPHI
New Advantage Plan Connect Time Rate Announced: $4.80 Per Hour At 300, 1200, Or 2400 Baud

DELPHI has lowered the rates for Advantage Plan members, making their connect time rates the lowest in the industry for overall non-prime access. DELPHI's Advantage Plan is a relatively new level of membership whereby members receive a discount in hourly rate in exchange for volume usage. Advantage Plan members must agree to a minimum $24.00 per month billing, which is of course no problem for those who use more than six hours per month (which would cost $43.20 at DELPHI's normal non-prime rate of $7.20 per hour).

To join the Advantage Plan, type USING ADVANTAGE at DELPHI's Main Menu. New DELPHI members can also join as Advantage Plan members the first time they log on.

Premier Electronic Encyclopedia Now Available On DELPHI

Grolier's Academic American Encyclopedia, the number one online encyclopedia, is now available on DELPHI. Searchable by keyword, this comprehensive encyclopedia contains more than 10 million words and 31,000 articles. There's also a cross-reference feature that allows you to quickly access related articles. An exclusive Trail command keeps track of all references during a session.

The Academic American is the perfect research aide for students, professionals, and writers—anyone who is curious about anything. It offers a standard of quality in content and presentation that is unequaled. Information in the encyclopedia is always current, with updates at least four times per year. Among the many topics on which detailed articles are available are:

* science and medicine
* space and technology
* arts and entertainment
* economics and industry
* government and politics
* history and geography
* biographies and profiles

If you can't find what you're looking for—don't worry! Just ask the Experts at Grolier. Grolier's staff of editors will answer your questions and send a report directly to your DELPHI mailbox, in many cases within 24 hours.

Grolier is available at regular DELPHI connect rates. To access the Academic American Encyclopedia, simply type: LIB GROLIER at DELPHI's main menu.

Incidentally, if you are not a DELPHI member, you can join DELPHI at the special signup rate for *Computer Shopper* readers of only $19.95. This includes one FREE hour of usage as well as the comprehensive *DELPHI: The Official Guide* written by Michael A. Banks and published by Simon & Schuster. Here is how to join immediately:

1. Dial 617-576-2981 with any terminal or PC. (Or, dial your local Telenet node and type C DELPHI at the @ prompt; or dial your local Tymnet node and type DELPHI at the "please log in" prompt.)
2. When connected, hit return once or twice.
3. At username type: JOINDELPHI.
4. At password type: SHOPPER.
5. You will then be prompted for the information needed to establish your account.

For more information, you can call DELPHI Member Services at: 800-544-4005 or 617-491-3393 from within Massachusetts.

BIX
New Logon Screen

BIX has removed the ASCII-graphics BIX logo that was displayed as a part of the service's logon screen. The new screen gets to the I.D. and password prompts much more quickly. If you've been using a script file that looks for the giant BIX logo to logon, and haven't logged on in a while, you should log on manually to see where to modify your script file.

CompuServe
New Version Of Macintosh Navigator Software Now Online

Macintosh owners to use CompuServe's Navigator software will be interested to know that a new version is now available. The latest version, 2.1, offers several important enhancements, among them the ability to update forum specifications, enhanced dialog boxes, and more.

Those using the old shareware version of Navigator can order the new version online (the price is $20.00). If you're a registered user of Version 2.0, you can download 2.1. See the Navigator main menu for details.

GEnie
RoundTable Changes And Additions

GEnie's RoundTables have undergone a number of changes in recent months as the service continues to evolve.

The Writers' RT (WRITERS) has added an online bookstore, where members may order books at a discount. The catalog is rather eclectic, ranging from historic tomes and novels to books about writing. Of special interest to bargain hunters are "remaindered" books—quality books which are out of print and are being sold off by their publishers. The discounts range from 40% to 90%.

As of July, 1988, The Home Office Newsletter RT area on GEnie ceased to exist. All files supplied by CSM (the sponsor of the RT) were removed. GEnie management intends to continue carrying a "Work at Home" RT, however. (The Home Office News continues to exist in the form of the printed *Home Office News Magazine*. For information, contact: Joseph Rotello Jr., CSM, 4120 Galbraith School Road, Knoxville, TN 37920.)

Other changes include new management for the IBM PC RoundTable, and the addition of an Aviation RT (M 410) a SuperMac RT (M 415), and a Radio & Electronics RT (M 345).

New Commands In Software Libraries

GEnie members will be interested to see a new selection on RT Software Library menus (#2). The new selection, "Directory of New Files," displays a directory of new files (files added since a member's previous logon).

GEnie has also changed the way the Software Library Search command works to speed up the search process. Keyword searches now find only those files that begin with the string specified as the keyword. And files can no longer be searched by date only, although date can be used as a supplementary criteria with keyword or uploader I.D. searches.

New Download Protocols In Software Libraries

GEnie has implemented two new download protocols, Xmodem 1-K and Ymodem, in its software libraries. Xmodem 1-K uses 1024 byte blocks instead of the normal Xmodem 128 byte

continued on page 522

BULLETIN BOARDS

The Bulletin Board is a regular feature of the *Computer Shopper*. This is where you can list your COMPUTER RELATED Remote System at no charge. All listings are in state (with non-U.S. listings last) and phone number sequence. If you would like to have your Remote System listed, please follow the instructions listed below:

Submission Policy

All Remote System entries must be submitted in **writing** by the first of every third month and must include the phone number for the system. **Submissions received by the first of August will appear in the October issue.** The listing will be good for the next three issues unless the information is found to contain errors.

Due to the increased size of this listing, it has become necessary to reduce the number of systems listed on these pages. Effective immediately, only systems supporting computer-related topics with storage capacity of at least 10 MebaBytes and for which the SysOps have submitted complete details about the system will be published. We will continue to include **ALL** systems in the REMSYSmm.0yy text file which is distributed on GEnie, and many remote systems. **FOG**, THE International Nonprofit Computer Users Group, is an organization devoted to the enhancement of the computer experience. Maintenance and verification of entries in **The Bulletin Board** is just one of the many services funded by FOG members for the computing public.

A large percentage of the listings received have been voice numbers not associated with Remote Systems. This is an inconvenience for owners of the phone numbers which must be eliminated.

FOG members will attempt to verify that each listing is in fact a remote system. If a listing is found to be inaccurate, it will immediately be deleted from the listing. **If an update report is not received** every three months, the listing will also be deleted. All SysOps are responsible for promptly forwarding accurate information to:

FOG
Remote System listing
P. O. Box 3474
Daly City, CA 94015-0474

or one of the following E-mail services:

on GEnie, address mail to OFFICE.FOG

on MCI Mail, address mail to 347-8112 (or FOG)

on CompuServe, address mail to 71561,570

on FOG #6 (415-755-8315), leave a comment to the SysOp

Please include the system's phone number in all correspondence. If reporting a phone number change, be sure to include **both** the old and the new numbers. We cannot locate a system without a phone number.

We are not responsible for errors published in these listings.

United States

Alaska

(907)349-2459 Anchorage. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Truman S. Walrod. TW3 BBS & RCP/M+. Sponsored by **FOG** A.M.O. 63--Ankor-Guide Computer Group. Using Exec & Metal.

(907)688-0143 Anchorage. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 100Mb) SysOp: Paul Zumwalt. ZEE ZOO RBBS. For IBM-PC & compatibles. Business, games and graphics files available.

Alabama

(205)341-1616 Mobile. Baud: 300, online: 24 hrs/7 days SysOp: Edward W. Jones. Co Co Board of Mobile. Using CoCoI for 7/1/N. All downloads, articles, and notices are for the Color Computer user.

(205)344-7606 Mobile. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Jarrod White. Computer Confabulation with Michael Knudsen. Using RBBS for conferences, door, messages, files and graphics.

(205)478-5723 Mobile. Baud: 3/12, online: 24 hrs SysOp: George Schroeter. Night Light BBS. Using Commodore for incredible online games and original enhancements. Color graphics. Up/downloads for C-64/C-128 only.

(205)536-3827 Huntsville. Baud: 3/12, online: 24 hrs/7 days (disk space = 30Mb) SysOp: M.D. Smith. MDS-PC-RBBS. For PC and compatibles. Public domain software. Up/downloading. 8/N/1.

(205)586-3064 Arab. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Chuck Chamblee. DataComm PC-BBS. Using OPUS 1.03b for IBM, Commodore, Amiga. Messages, file transfers, online games.

(205)854-9074 Birmingham. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 375Mb) SysOp: Bill Freeman. The Connection BBS. For politics and jokes,religion Con.Supports IBM/compatibles, Apple, Atari, Amiga, C-64/C-128.

(205)854-9661 Birmingham. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 130Mb) SysOp: David Alge. Pinson Valley PCBoard. Using PC Board 12.1/E3 for conferences covering all popular computers. Also have specific SIGs, Trade war, more.

(205)866-7111 Citronelle. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Joe Chancery. Byte Junction. Using Atari ST for OBM, Atari, CoCo,. Many downloads.

Arkansas

(501)224-9454 Little Rock. Baud: 3/12, online: 24 hrs/7 days SysOp: Rick Mobley. XBBS-LR. Sponsored by Little Rock CP/M-MS/DOS Tech User G. Using XBBS 6.00 for CP/M and MS/DOS. 8-N-1.

(501)273-9257 Bentonville. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Don Chick. The Chicken Coop BBS. Using TBBS 2.0S for online magazines, games and downloads for IBM and C'dore 128/64. Multiple msg. bases/classifieds.

(501)442-8777 Fayetteville. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Gary Funk. T R S 7. Using TBBS 2.0S for mainly Commodore but has MS-DOS download area. Fido node 19/777 and 129/49 with SEAdog 4.0.

(501)521-0547 Fayetteville. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Mark Carter. MegaBoard. Using Red Ryder Host v1. for Macintosh and Apple II users but has MS-DOS download.

(501)575-7280 Fayetteville. Baud: 3/12/24, online: 24 hrs SysOp: Mark Botner. CSEG BBS with David Summer. For PC Board, IBM, Apple, C-64. Sponsored by the university of Ark.

(501)636-2281 Rogers. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 104Mb) SysOp: Jerry Hunter. DMC OnLine Telecomm.. Using DMC 386 & RBBS for Supports IBM and Commodore. Confs: sysops, BBSads, CAD, CBM, Telcomm, buy & sell. Fees for downloads.

(501)735-9980 West Memphis. Baud: 3/12, online: 24 hrs/7 days SysOp: Michael Dorman. Midnight BBS. Sponsored by Mid-South TI-99/4A Users Group. For the T199/4A, Geneve 9640 and IBM computers.

(501)864-0699 El Dorado. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Jeff Johnson. The Rock CFC. Using TBBS Fido for computers for Christ Christian BBS. Fidonet echomail.

(501)886-1639 Walnut Ridge. Baud: 3/12/24/96, online: 24 hrs (disk space = 32Mb) SysOp: Perry Parsons. Communicaton Central. Using Opus 1.03b for message bases including Echo-mail. U/D. Classifieds.Specializing in MS-DOS color computers.

(918)834-8272 Tulsa. Baud: 3/12/24, online: 24 hrs (disk space = 40 Mb) SysOp: Ray Brown. T.A.R.C.. Sponsored by Green Country Computer Association. For downloads, OASIS, science-finction format. View personal ads from Tulsa area.

Arizona

(602)254-2185 Phoenix. Baud: 3/12/24, online: 24 hrs SysOp: Jerry Reed. PHUG BBS. Sponsored by Phoenix Heath Users Group. For Heath/Zenith related inof. public domain programs for HDOS, CP/M, ZDOS,MS-DOS. Message section.

(602)279-5360 Phoenix. Baud: 3/12, online: 24 hrs SysOp: Sue Widemark. Programmer's DATA Line. Using SuBBS for serious info exchange concerning programming in: C, Pascal, dBASE III + /Clipper, BASIC, HyperCard,.

(602)326-5629 Tucson. Baud: 3/12/24, online: 24 hrs/7 days SysOp: David Kha. Liverpool Express. Using Apple IIgs for both Apple and IBM. Large DL library, exchange GBBS-Pro mods. E-Mail, discussion. Online games.

(602)458-5420 Sierra Vista. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: John Sebens. Sierra Vista BBS. Using PC-Board v12.1d for CPM files. Upload/download files. Message areas.

(602)459-6514 Sierra Vista. Baud: 3/12, online: 24 hrs/7 days SysOp: Bill Morris. Starbrite BBS. Using Atari for 200 programs online. ST programs. Supports Atari 8-bit & 16-bit. Other computers welcome.

(602)495-0000 Phoenix. Baud: 3/12/24, online: 24 hrs (disk space = 70Mb) SysOp: Rick Johnson. Sho-Tronics. Using Sho-Tronics' Turbo for over 450 Mb downloadable IBM compatible software. Tele-conferencing, electronic mail, classifieds.

(602)582-3643 Phoenix. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 138Mb) SysOp: Dale Williamson. JCS BBS. Using 1.11 #87149 for 900+ files, Tech/Science/Current Events- Full line of computers/accessories/optical drives. 8-N-1.

(602)829-8342 Phoenix. Baud: 3/12, online: 24 hrs (disk space = 200Mb) SysOp: R. Stephenson. The KeyBoard. Using PC Pursuitable for numerous computer/general symposiums. Multi-user "chat"/on-line games. 8 incoming lines.

(602)842-4635 Glendale. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 230Mb) SysOp: Charlie Parvin. The EXTERMINATOR BBS. Using Wildcat for multiple files, message areas. Dial-a-match. Adult. Educational. Games. E-Mail, more.

(602)890-0182 Mesa. Baud: 3/12/24, online: 24 hrs SysOp: Robb Topolski. Radio Free Arizona. For online discussions. technical, political debate, music topics, Echomail, downloads.

(602)926-9276 Mesa. Baud: 3/12/24, online: 24 hrs SysOp: Jim Schuring. Sams Place BBS. Using PC-Board 12.1/D for aviation, game, sysop conf., several doors. 24 hr ver. for long distance calls. PC-Pursuitable.

(602)984-4049 Tempe. Baud: 3/12/24, online: 7pm to 7am (disk space = 32Mb) SysOp: Bob Jacobs. QuestNet BBS. For Rosicrucian fellowship & synthesis of science and religion. **PRACSA member.**

(602)995-3321 Phoenix. Baud: 12/24, online: 24 hrs/7 days (disk space = 65Mb) SysOp: Steve Irving. Nighthawk. For PC Puspuitable, Supports ANSI color/graphics and a variety of computer brands.

California

(209)239-9853 Manteca. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 95Mb) SysOp: Kenneth Roach. Bertha Board. Using 8/N/1 FX-BBS for MS-DOS oriented. Emphasis on programming and source code. Uploads and downloads-No fee. Reg. require.

(209)368-8950 Lodi. Baud: 3/12, online: 8pm-7am/7days SysOp: Mike Donovan. The Mother Ship. For Commodore users. Features include topical & casual message subboards,U/DL, online games.

(209)438-4234 Fresno. Baud: 3/12/24, online: 24 hrs SysOp: Scott Moore. RSMBBS. For mainly MS-DOS, general files of all types. Publishing dBase/Clipper/DBMS. Legal field. Full U/D.

(209)474-7422 Stockton. Baud: 300, online: 24 hrs/7 days SysOp: John Swingle. SCUG BBS. Sponsored by **FOG** A.M.O. 139--. Using Commodore.

(209)521-4910 Modesto. Baud: 3/12/24, online: 24 hrs SysOp: Tim Smerdon. Smedon's CASEL with Sharon Smerdon. For California attractions, sights & entertainment listing.

(209)688-4123 Tulare. Baud: 3/12, online: 8pm - 5am Pacific SysOp: Robert L. King. Collossus BBS with Alan D. Glick. For solving software/hardware problems on wide range of computers: IBM, CP/M, Apple, Tandy.

(209)823-2803 Manteca. Baud: 3/12/24, online: 24 hrs SysOp: Tim Campi. Oasis Software Library. For IBM, and compatibles. No fee, registration required. Shareware and public domain.

(209)823-6133 Manteca. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Brian Collins. DANLEN CORP.. Using N-8-1 TBBS for Support all computer types and interests. Fantastic savings on all computer products and software.

(209)943-1880 Stockton. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Charles R. Hague. The Wrong Number BBS. Using PCBoard 12.0/D for mainly MS-DOS, others welcome. Intelligent conversation. Next time, dial The Wrong Number!.

(213)327-6235 Torrance. Baud: 3/12, online: 24 hrs SysOp: Monte Gmur. The Vaptain's BBS. For adoptees/birthparent (KINSEARCH) who are in search of blood relatives.

(213)422-7693 Long Beach. Baud: 3/12, online: 24 hrs SysOp: Lisa Townsend. South Bay Love Connect. For Email, advice column, matchmaking. General info files. 10 sub-boards, networking.

(213)423-4999 Long Beach. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 101Mb) SysOp: Mark Bishop. Carrier-Point Info.. Using CD ROM to PC for nine lines on rotary. Offering a large library of downloads and 40 channel CB sinulation. **PRACSA member.**

(213)423-5797 Long Beach. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Jeff Glassman. Digital Diversions. Using PCBoard for MS-DOS file transfer libraries, multiple national and regional coferences.Aff with ASCBBO.

(213)548-3546 Newport Beach. Baud: 3/12/24, online: 24 hrs (disk space = 135Mb) SysOp: Barry Dobyns. Machinedo. For IBM, CP/M, Amiga, Mac, Atari. No fee, no registration, no pirates.

(213)860-5649 Cerritos. Baud: 3/12, online: 24 hrs/7 days SysOp: David Olson. Online Goldmine. For trivia, and horoscope. Classifieds, electronic yellow pages. Prestel graphics protols with reg.

(213)944-4348 Whittier. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Richard J. Scafuto. Scafuto Jewelry BBS. Using Wildcat for gemstone and jewelry enthusiasts. IBM up/downloads, no ratio. No fees, msg. base, classifieds.

(213)971-6260 Los Angeles. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Ed Grey. Grey Matter BBS& RCP/M. Using PBBS for Televideo CP/M Timex/Sinclair Dialog Help. No MS-DOS files.

(408)238-9621 San Jose. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Al Mehr. SERVU. Using AMPRO & HBBS for CP/M80, CP/M86, Macintosh, PC-DOS, MS-DOS software. **PRACSA member.**

(408)245-1420 Sunnyvale. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb)

Bulletin Boards

SysOp: Norman L. Beeler. ZEE Machine. Using Ampro & HBBS for public domain software. **PRACSA member.**

(408)262-5150 San Jose. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Fred Townsend. Z-Node 19. Sponsored by. Using CP/M 80 & RBBS for Heath/Zenith software, general interest.

(408)286-8240 San Jose. Baud: 3/12/24, online: 6pm to 6am (disk space = 12Mb) SysOp: David Hyatt. The Public Declaration. Using QX-10. **PRACSA member.**

(408)354-5934 Saratoga. Baud: 3/12, online: 24 hrs/7 days (disk space = 85Mb) SysOp: Chuck Metz. Saratoga PBBS. Using SD Z-80 & HBBS for Public domain software and technical information exchange. **PRACSA member.**

(408)462-6329 Santa Cruz. Baud: 3/12/24, online: 24 hrs SysOp: Dick Steele. Soquel BBS. Sponsored by AT&T Computer Users Group (S. Bay). Using 8-N-1 Wildcat for information about AT&T Computer Users Group- S. Bay.

(408)842-5754 Gilroy. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Brian Sowders. The Gilroy BBS System. Using IBM XT for the promotion of telcomm. and enhancement of IBM Computers. PC library for U/Dloads, E-mail.

(408)848-4839 Gilroy. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Michael Wanzong. Using RBBS-PC for general interest, public domain prgm exch. E-Mail. Sponsored by Gavilan College.

(408)986-0215 San Jose. Baud: 3/12, online: 24 hrs/7 days SysOp: K. Standifird. BAAUG BBS. Sponsored by Bay Area Atari Users Group. For Atari computer systems support.

(415)255-2981 San Francisco. Baud: 3/12, online: 24 hrs. SysOp: Ken Hunter. QU-ANTO. For Math., Statistics, scientific programming, Pascal.

(415)285-2687 San Francisco. Baud: 3/12, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Bond Shands. KAY*FOG. Using Kaypro & Metal for Novices and subject (dBASE, WordStar, MEX, etc) conferences -- mail registration required. **FOG member.**

(415)352-5087 San Leandro. Baud: 3/12, online: 24 hrs SysOp: Eric Echols. Online Goldmine. For classifieds, electronic yellow pages, trivia and horoscope. Prestel Graphics. 7-EVEN-1.

(415)361-1847 Redwood City. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 232Mb) SysOp: Dick Worth. Emerald Lake (FOG 48) with Doug Spence. Using Wildcat! for complete and up-to-date FOG-DOS disk. FOG-CPM on requestle. **PRACSA member.**

(415)365-7836 Redwood City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Edward Hayes. BAHUG. For Heath / Zenith users. **PRACSA member.**

(415)439-0880 Pittsburg. Baud: 3/12/24, online: 4 pm-5:30 am M-Th SysOp: Brent Walton. The Eagle's Nest. For a system dedicated to Boy Scouts of America. DL for DOS, games, programs. Online registration.

(415)441-0616 San Francisco. Baud: 3/12/24, online: 24 hrs SysOp: Steven Clifford. Transporter. For IBM PC's and comp. 5 conf, doors, SIGs for Apple, Atari, CoCo, Commodore, Macintosh.

(415)547-5264 Emeryville. Baud: 3/12/24, online: 24 hrs (disk space = 32Mb) SysOp: Robert Schutz. AutoCAD RBBS. Using RBBS for color graphics, DL, messages. AutoCAD, IBM and compatibles.

(415)572-8219 San Mateo. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Ernest Hintz. KAYFUN BBS System. Sponsored by Peninsula Kaypro Users Group. Using Kaypro & MBBS for CP/M, Kaypro, MS/PC-DOS, dBASE, Turbo Pascal, Business app. Online app required to enter msg & d/l.

(415)581-0449 Castro Valley. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Gordon French. The French Connection. Using Compupro for Goliath/ CALLME node 092. **PRACSA member.**

(415)591-6259 Belmont. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 92Mb) SysOp: Roy Robinson. Mid-Peninsula BBS. Using clone & PC Board for CP/M & MS-DOS support. **FOG member.**

(415)595-2427 San Carlos. Baud: 12/242/96, online: 24 hrs SysOp: David Smith. Toad Hall. For six public conferences, authorized pics distributer, public domain software.

(415)621-2609 San Francisco. Baud: 12/24, online: 24 hrs SysOp: Richard Couture. SFpcUG BBS. Sponsored by San Francisco PC Users Group. For info about the San Francisco PC Users Group.

(415)626-1246 San Francisco. Baud: 3/12, online: 24 hrs SysOp: Ben Gardiner. The AIDS Info BBS. Using Xenix for AIDS information. Instant registration, no charges. Two lines on call-hunter.

(415)723-7995 Palo Alto. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Ralph Muraca. SPARC. Sponsored by Stanford Palo Alto User Group. For Sponsored by Stanford/Palo Alto User's Group for the PC.

(415)755-2030 Daly City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 94Mb) SysOp: Gale Rhoades. FOG # 1 with Jack Brown. Using Osborne & Metal for distribution of FOG Disk Library. FOG or PRACSA membership required for access to download area. **FOG member.**

(415)755-8315 Daly City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 11Mb) SysOp: Jack Brown. FOG # 6. Using XT clone * PICS for technical information and FOG uploads -- open to the public. **FOG member.**

(415)849-2684 Berkeley. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 320Mb) SysOp: Raines Cohen. BMUG BBS. Sponsored by BMUG. Using Macintosh for Berkeley Mac User Grp members only. 6 phone lines in rotary. TBBS/Seadog. confer., plus CD-ROM.

(415)864-6430 San Francisco. Baud: 3/12, online: 24 hrs SysOp: Tom Karnes. Baytalk BBS. Sponsored by BAYTALK Computer Users Group. For visually & physically impaired users. Up/Downloads.

(415)895-0135 San Leandro. Baud: 3/12/24, online: 24 hrs (disk space = 30Mb) SysOp: Bob Shayler. Open Campus BBS. Sponsored by San Leandro Apple Eaters User Group. Using GBBS for Education(students and teachers-San Leandro HS), 34 message bases, inter-system e-mail, file section.

(415)895-1785 San Leandro. Baud: 3/12/24, online: 24 hrs (disk space = 5Mb) SysOp: Bob Shayler. SNLNDRO BBS. For CMS v12 FrEd-Mail Network system. Devoted to education. Restructed to educators.

(415)938-9470 Walnut Creek. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 66Mb) SysOp: Werner Gumpert. Co-Ed Associates with Pat Miller. Using Morrow MD11 & HBBS for Software exchange. **PRACSA member.**

(415)939-1246 Pleasant Hill. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Richard Hanson. CLUB 100. Sponsored by CLUB 100: Model 100 Users Group. For world's largest membership system dedicated to Radio Shack Model 100, 102, 200.

(415)945-7799 Walnut Creek. Baud: 2400, online: 24 hrs SysOp: Chris Weiss. Farce. Sponsored by The IBM & Compatibles Users Group.

(415)948-2513 Los Altos Hills. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Irv Hoff. PRACSA. Sponsored by Public Remote Access Comp. Standard. Using Ampro & PBBS for PRACSA-member only system (9600 is Racal-Vadic). **PRACSA member.**

(415)948-6656 Los Altos. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 22Mb) SysOp: David McCord. Z-Node Central. Using Ampro & Z-MSG for source of ZCPR3 software & support. **PRACSA member.**

(415)968-7369 Mountain View. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 108Mb) SysOp: Jim Switz. SIGSIG (FOG #31). Using AT clone & Auntie for MS-DOS & CP/M up/downloads. State-of-the-art BBS, optional ANSI color. PC-Pursuitable 408/415 nodes.

(415)969-5486 Mountain View. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Mike Durkin. Tele-Soft RBBS. For online games, E-Mail,, MS-DOS files. All systems welcome.

(415)992-8542 Daly City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 45Mb) SysOp: Jack Brown. FOG # 3. Using PC-XT & PICS for FOG members, especially those using MS-/PC-DOS. **FOG member.**

(619)243-2417 Victorville. Baud: 3/12, online: 8pm-8am (disk space = 20mb) SysOp: Christopher Veres. RBBS-PC. Sponsored by The High Desert Public Domain U.G.. For IBM up/downloads, conferences, message base etc.

(619)327-5289 Palm Springs. Baud: 300, online: 9pm-9am (disk space = 13Mb) SysOp: Paul Hencke. Software Etc with Mike Morales. For public domain software, mail order service. Arcs for Mac. Apple, Commodore, Atari, Amiga.

(619)486-1014 Poway. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Vivian Lynes. Family Heirlooms RBBS. Using RBBS-PC for Genealogy and general purpose, E-mail, 15 Directories for Up and Downloading.

(619)571-6366 San Diego. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Mike Stark. The 8-bit Tandy. Using TRS-80 for Model I-III-4, Portable 100/102/200, CP/M and OS-9. Downloads and E-mail available.

(619)584-1715 San Diego. Baud: 12/24/96, online: 24 hrs/7 days SysOp: John Dwulet. San Diego Live. Using IBM for Uploads/Down-Loads, Public and Private Message Bases.

(619)585-1638 San Diego. Baud: 3/12, online: 6 pm to 6 am PST SysOp: Ron Dugrenier. COMPUFACTS. For technical documents & schematics machine specific utility & diagnostic programs.

(619)749-3432 Vista. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 100Mb) SysOp: B.J. Nash. PD-SIG THE TBBS. For E-mail and messaging,Online categorized public domain software and shareware.

(707)437-3597 Fairfield-Suisun. Baud: 3/12, online: 24 hrs/7 days (disk space = 21Mb) SysOp: Chuck Warren. Neutral Zone BBS. Using Vision for on-line games. UL/DL. Message bases.

(707)526-0824 Santa Rosa. Baud: 3/12, online: 24 hrs SysOp: Dave Willey. Commodore Users BBS. Sponsored by Santa Rosa Commodore Users Group. For public discussion, GEOS, DEPLOACY Game, text files, up/Downloads.

(707)539-1279 Santa Rosa. Baud: 3/12/24, online: 24 hrs (disk space = 10Mb) SysOp: Jim Bianchi. zUCCINNI tREE RCP/M. Using PBBS 4.1, CP/M PD for RLE, games, Xmodem & Ymodem supported. Open system.

(707)552-0462 Vallejo. Baud: 3/12/24, online: 24 hrs (disk space = 80Mb) SysOp: Joe Martin. The Power Station. Using Wildcat for IBM compatibles,Apple, Atari. Messages, files, 42 live Doors! Over 575 files online.

(707)578-0385 Santa Rosa. Baud: 3/12/24, online: 24 hrs SysOp: Mike Snider. Using FidoNet for 28 message ares, including alternative lifestyles.

(707)746-5820 Benicia. Baud: 3/12/24, online: 24 hrs (disk space = 80Mb) SysOp: Derek Koopowitz. DCC BBS. Using Wildcat Premier for online games,IBM Public Domain/shareware files. Echo conference.

(707)882-2390 Point Arena. Baud: 3/12/24/96, online: 24 hrs (disk space = 75Mb) SysOp: Alan Niven. Post Board BBS. For Postscript and Desk Top Publishing. Atari ST, Mac, PC & others.

(714)355-0373 Fontana. Baud: 3/12/24, online: 24 hrs SysOp: Steve O'Toole. TEC-PC. For downloads from Radio and Electronics magazine & Micro Cornucopia w/ areas for ham radio & tech. sup.

(714)496-2419 San Juan Capistrano. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Daryl Lytton. Gateway's CompuComm with Ana Martic. For 8/N/1. Multi-user (5 lines) Goliath Node #0154. US PD S/w Exhange, boards, SIGs, etc. Fee system.

(714)778-0948 Anaheim. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 100Mb) SysOp: David Kleinschmidt. The Circuit Board. Using IBM PC for IBM-PC software.

(714)820-4364 Rualto. Baud: 1200, online: 24 hrs SysOp: Lesley Masterson. The Eagles Nest. For 6 sub boards. Using C-64 for U/D. C-64,128 games welcome. All computers welcome.

(714)839-9580 Westminster. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Eric Drochner. PC-LAIR. For PC-DOS, MS-DOS. Large PD software library.

(714)893-6366 Garden Grove. Baud: 3/12/24, online: 24 hrs SysOp: Abe Saadeh. CalTech BBS. For multi-interst, messages and download areas, political forum conf.

(714)894-2246 Long Beach. Baud: 3/12/24, online: 24 hrs SysOp: Steve Donegan. Stanton Public Domain. Using Xenix for multi-user system.

(714)963-8551 Hunting Beach. Baud: 3/12, online: 24 hrs SysOp: Scott Guagliardo. Network 23. Using 8-N-1 for 16 user system featuring interactive games, chat lines. All users welcome.

(714)981-6968 Upland. Baud: 3/12/24, online: 24 hrs (disk space = 200Mb) SysOp: Janis Stuart. The Postergirl's BBS. For 2 ST subs, Netmail, 2-16 users chat. All computer UD, games, contest. Free.

(714)987-4842 Alta Loma. Baud: 3/12/24, online: 24 hrs (disk space = 300Mb) SysOp: Javier Henderson. The Resource. Using WWIV 4.00 for various sub-boards, DL from games and communications to source in various languages.

(714)989-7745 Rancho Cucamonga. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Ron Pothier. The Winery Atari BBS. Using Atari for online games, etc. for all users. Semi-private system. 13 message bases.

(805)264-1219 Lancaster. Baud: 3/12/24, online: 24 hrs SysOp: Dave Frailey. dCOM Support Board. For support of registered and unregistered dCOM users.

(805)322-8800 Bakersfield. Baud: 3/12/24/96, online: 24 hrs/7 days SysOp: Rick Heming. INTER-COMM with Jim Carter. Sponsored by Kern Independent PC User Group. Using Wildcat for members only!.

(805)528-3753 Los Osos. Baud: 3/12/24, online: 24 hrs SysOp: George Campbell. Slo Bytes BBS. Sponsored by Slo Bytes IBM PC User's Group. For information about the Slo Bytes IBM PC Users Group.

(805)648-7833 Ventura. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Mike Van derSommen. Lorraine BBS with David Gullett. For 100% Amiga specific News, downloads, message bases. Associated V. A. U. X.

(805)735-6964 Lompoc. Baud: 3/12/24, online: 24 hrs (disk space = 10Mb) SysOp: Jim Williams. Macquilibrium BBS. Using XT clone for Macintosh. Up/downloads, message areas.

(805)983-3796 Oxnard. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Alan Stansbery. Global*Village BBS. Using FidoNet for MS-PC/DOS file transfers. NO Handles please. All others are welcome.

(818)242-2365 Van Nuys. Baud: 3/12, online: 24 hrs/7 days SysOp: Greg Anders. DELOS. For Multi-user will 10 lines. One-on-one chats and group chats. E-mail, many diff. public-sub-board,U/DL.

(818)363-3505 Tarzana. Baud: 3/12/24, online: 24 hrs (disk space = 106Mb) SysOp: Jon Dekeles. The Way-IBM. For IBM 286, online games.

(818)363-3925 Tarzana. Baud: 3/12/24, online: 24 hrs (disk space = 91Mb) SysOp: Jon Dekeles. The Way-Node ST. For network E-Mail, citadel software. Atari 1040ST.

(818)366-1238 Granada Hills. Baud: 12/24/96, online: 24 hrs/7 days (disk space = 160Mb) SysOp: Tom Tcimpidis. The MOG-UR'S EMS. Using AMI 386 for private/public mail, 24 SIGs, 26 file sections, multi-interest system. Free but requires mail reg.

(818)446-5937 Arcadia. Baud: 3/12/24, online: 8am to 10pm (disk space = 80Mb) SysOp: Richard Smith. OKOK/RCPM - FOG SYS 36. Sponsored by **FOG** A.M.O. 84--Osborne Komputer Owners Klub. Using Osborne 1 & Metal. **FOG member.**

(818)507-1365 Glendale. Baud: 3/12/24, online: 24 hrs SysOp: John C.. The Twilight Zone. For color animated graphics with sound. 10 lines-private & group chat. E-Mail, messages, database, library.

(818)508-7484 Studio City. Baud: 3/12, online: 24 hrs SysOp: Greg Anders. Delos. For E-Mail,one-on-one chats, group chats, U/D. All new users are telephone verified.

(818)762-4366 North Hollywood. Baud:

3/12/24, online: 24 hrs SysOp: Greg Anders. Board with no name. For U/D, E-Mail,one-on-one chat, group chats.
(916)338-1571 Sacramento. Baud: 3/12, online: 24 hrs SysOp: John Riley. River City Tibbs. Using Ti-99/4A for TI- xmodem file transfers. All computers welcome.
(916)668-1816 Woodland. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: Everett Duty. For IBM and compatibles. U/D. Business related appl, used computers for sale, programming and consult.
(916)786-3923 Roseville. Baud: 300, online: 24 hrs SysOp: Otto Haiungs. CompuHelp. Sponsored by International Blind Users Group. For database that allows user imput of mail and bulletins.
(916)927-3012 Sacramento. Baud: 3/12, online: 24 hrs/7 days SysOp: Woody Large. Sac TIBBS. Using TI99/4A for XMODEM file transfers, online 4 years.
(916)929-0692 Sacramento. Baud: 3/12, online: 24 hrs SysOp: David Knight. The Knight's Castle. Using TI-99/4A for online games. Library room. 3 message bases. Xmodem file transfers for TI.

Colorado

(303)223-1297 Fort Collins. Baud: 3/12, online: 24 hrs/7 days (disk space = 20mb) SysOp: James Cherry. AmNet On-line. Using XT clone &TBBSv2.0 for animal rights, environmental information network. MS/DOS, St, Amiga, commodore Sigs and downloads.
(303)428-0372 Westminister. Baud: 3/12, online: 24 hrs SysOp: Vince Cooper. The Hollows BBS. For adoptees/ birthparent (KINSEARCH) for search of blood relatives.
(303)450-5285 Denver. Baud: 3/12, online: 24 hrs SysOp: Mark Payne. Rocky Mtn 99ers BBS. Sponsored by Rock Mountain 99ers. For downloads, uploads, messages, text for TI99/4A & Geneve 9640.
(303)465-3729 Broomfield. Baud: 3/12/24, online: 24 hrs/7 days SysOp: T.J. Connolly. PC Computer Brokers. Using RBBS-PC for uploads/downloads, messages, conferences.
(303)493-4094 Fort Collins. Baud: 3/12, online: 24 hrs SysOp: Tom Oppenheimer. FRPCUG BBS. Sponsored by Front Range PC Users Group. For information about Front Range PC Users Group.
(303)665-9152 Lafayette. Baud: 3/12, online: 24 hrs/7 days SysOp: Harold Piser. NEW AGE Bulletin Board. Using PC-XT, TBBS for inner development, holistic health, environment, a NEW AGE forum.
(303)680-7209 Denver. Baud: 3/12, online: 24 hrs/7 days SysOp: Ted Williams. SOUND DOCTRINE BBS. For serious christianity.(Christian & non-Christian welcome). Discussions. Order free tapes and material.
(303)680-8153 Aurora. Baud: 3/12/24/96, online: 24 hrs/7 days SysOp: Lawrence Mehl. Modem Net. For general messages.
(303)690-4483 Denver. Baud: 3/12, online: 24 hrs (disk space = 64Mb) SysOp: Glenn Phillips. The Highlands. Using QuickBBs for quality downloads, messagesm online games. PC pursuitable.
(303)978-0298 Littleton. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Ron Sellers. RSS.BBS. For Supporting 8-bit Atari since 5/83. Movies online. 8/N/1.
(719)384-8221 La Junta. Baud: 3/12, online: 24 hrs/ 7 days SysOp: G.L. Fagan. Ark Valley BBS. Using Amiga for IBM, C-64 and Amiga support.
(719)531-9674 Colorado Spring. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Jim Cannell. COSUG BBS. Sponsored by Colorado Springs PC Users Group. Using Fidonet 128/13 for Supporting IBM and compatibles, sponsored by the Colorado Springs PC Users Group.
(719)574-2567 Colorado Springs. Baud: 3/12, online: 24 hrs/7 days SysOp: Joe Nuvolini. Villa-TI. Sponsored by Front Range 99'er Computer Club. Using TI99/4A.

Connecticut

(203)456-1933 Willimantic. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Dean Petix. The Willi-Board BBS. Using Opus 1.03, SEAdog for on-line games, utilities. Supports all computers. Member of FidoNet and IFNA.
(203)469-9913 East Haven. Baud: 3/12/24, online: 24 hrs SysOp: Brian Wall. Off The Wall. Using OPUS for IBM files and message areas. Member of the PC Network.
(203)481-5538 Branford. Baud: 12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Chuck Spear. The Transfer Station. Using TandySX1000 & FIDO for local Echo Mail. OPUS Utility warehouse. Good new & used IBM compatable hardware. **FOG member.**
(203)481-7475 Branford. Baud: 3/12/24/96, online: 24 hrs SysOp: Aaron Waxman. Hippocampus BBS. Using Quick BBS for online games, conferences, Echo and Netmail.
(203)484-4637 Northford. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 44Mb) SysOp: Frank Whitman. Whitman Software Sys. Sponsored by **FOG** A.M.O. 54--Yankee Osborne Users Group. Using Osborne 1 & PBBS for CP/M and MS-DOS general interest and utility programs. **FOG member.**
(203)698-0588 Old Greenwich. Baud: 12/24/96, online: 24 hrs/7 days (disk space = 330Mb) SysOp: Jim Bolster. StarPort. For online conferences. Astronomy related.
(203)848-7942 Oakdale. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Lester Osborne. Oakdale PBBS-RCP/M BBS. For CP/M, MS-DOS, Commodore, Apple, Atari.
(203)932-8222 Milford. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 80Mb) SysOp: Jay Ferron. ProDOS News BBS. Using Apple IIgs for online games, u/d-loading, casino, stock market, simulations, role-playing, etc.

Florida

(305)253-1494 Miami. Baud: 150/3/12, online: 24 hrs/7 days SysOp: Ted Wallace. Cob's Corner BBS with Debbie Wallace. Sponsored by Miami Individuals w/Commodore Equip. For Support commodore. Features E-mail, posting of bulletins, and using up/downloading functions.
(305)262-1787 Miami. Baud: 3/12/24, online: 6am-10pm SysOp: Hector Martinez. Miami Connection. Using Wildcat for DOS utilities, Dbase realted, languages, word processing, spread sheet, communication.
(305)279-6223 Miami. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 105Mb) SysOp: Eric Shore. USA RCPM/RDOS. Sponsored by **FOG** A.M.O. 26--Gold Coast Computer Group. Using Vixen & Metal. **FOG member.**
(305)279-9145 Miami. Baud: 3/12, online: 24 hrs/7 days SysOp: Juan Poggio. Super Link BBS. Using C-net 11.8 for all computer. U/L. Entertainment system, online games, headline news, trivia, weather report.
(305)581-9177 Fort Lauderdale. Baud: 3/12, online: 24 hrs (disk space = 63Mb) SysOp: Robert Bouchard. Electronic Locksmith. For technitips, bulletin boards, message boards, up/downloads. Sponsored by Bouchard & Masters, Inc.
(305)621-7534 Miami. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Ken Burch. Miami PC User Group with Robert Ash. Sponsored by Miami PC User Group Inc. Using PC Board 11.8/D.
(305)777-5989 Indian Harbour Beach. Baud: 12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Louis Cohen. Beach Realty ROS BBS. Using IBM for Complete section for real estate files and other P/D files. Interesting message base. No fees.
(305)791-9574 Hollywood. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Terry Windmiller. PHOENIX BBS. Using RBBS 16.1a for For support of ATT 6300 and compatibles, Public domain software library.
(305)940-8795 North Miami Beach. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 17Mb) SysOp: Scott Heath. The Heath Bar BBS. For online games (1 multi-user), chat, personals, E-mail, storys, polling ad-libs. Online since 3/7/83.
(407)268-0286 Titusville. Baud: 3/12/24, online: 24 hrs SysOp: Robert Osband. Spaceport Technologies. Sponsored by Space Coast PC Users Group. For information about group.
(407)335-1254 Port St. Lucie. Baud: 3/12/24, online: 24 hrs (disk space = 10Mb) SysOp: Donald Nembland. Meadwood Express BBS with Glenn Doyle.
(407)348-5295 Kissimmee. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30mb) SysOp: Larry A. Charpiat. Atari Express BBS. Using Atari for ASCII/ATASCII downloads. A Carina Bulletin Board. NOTE: New Area Code!.
(407)366-0156 Orlando. Baud: 3/12, online: 24 hrs (disk space = 10mb) SysOp: Mike Ungerman. The Apple Tree BBS. Sponsored by Apple Tree of Central Florida. Using Apple][e, UBBS for the Apple Tree of Central Florida Users Group. General access for nonmembers, online signup.
(407)839-0333 Orlando. Baud: 3/12/24, online: 24 hrs SysOp: Donald Marsh. Vacation Florida Data. For info of interest to future florida vacationers. Email. Multi-line. Free to public. 8N1.
(407)857-3975 Orlando. Baud: 312, online: 24 hrs (disk space = 50Mb) SysOp: E Van Hensbergen. N.O.R.A.D. BBS. Using NoChange, FidoNET for message and file areas for all types of users. TradeWars 500t, TraskForce, Hack, R.P.G.s.
(407)951-7681 Palm Bay. Baud: 3/12, online: 24 hrs SysOp: Gary Blydenburgh. The Space Coast ROS. For IBM/ MS-DOS/ Atari ST.
(813)264-0073 Tampa. Baud: 3/12/24, online: 24 hrs (disk space = 95Mb) SysOp: Jim Unroe. Data Exchange. For sports theme. U/D.
(813)299-5694 Winter Haven. Baud: 3/12/24, online: 24 hrs/7 days SysOp: John Farrell. ZBBS. For and by Zbasic Programmers. Support for WENDIN DOS, MS/DOS, CPM. TRSDOS , APPLE, Macintosh.
(813)443-5465 Clearwater. Baud: 3/12, online: 24 hts SysOp: James Frye. For software files Tandy, IBM, etc.
(813)455-8449 Naples. Baud: 3/12, online: 24 hrs/7 days (disk space = 44Mb) SysOp: Kevin Stone. The Inner Circle. For multi-line adult computer dating BBS. Private & public. E-Mail, User chats.
(813)521-3969 St. Petersburg. Baud: 31224, online: 24 hrs (disk space = 700Mb) SysOp: Bill Staab. Jayhawk! BBS. Using Wildcat 1.12 for IBM, Amiga. Over 5000 files for DL. 30 mins free daily.
(813)681-2008 Tampa. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Adam Baldwin. MasterDate. Using ORACOMM node 28 for PC Designs.
(813)683-0214 Lakeland. Baud: 3/12, online: 24 hrs/7 days (disk space = 50Mb) SysOp: Chris McLaughlin. Termnet. Using IBM-XT for Games, downloads, business programs and more. Open to all computer users free of charge.
(813)684-5248 Tampa. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Adam Baldwin. The John Galt Line. Using Oracomm #28 for Oracomm #28 also.
(813)786-5460 Clearwater. Baud: 3/12, online: 24 hrs/7 days SysOp: George Lysy. – C – -Lion BBS. For support of IBM, Commodore, Radio Shack, Apple, Atari, & CP/M computers.
(813)837-5765 Tampa. Baud: 2400, online: 24hrs SysOp: J.C. Molette. Video Trader Network. Using 8/N/1 for on line information service.
(813)856-5071 Hudson. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Rob&Carol Marlowe. The Inner Sanctum BBS. For multiple message bases, large MS-DOS download area.
(813)869-3700 Port Richey. Baud: 3/12/24/96, online: 24 hrs (disk space = 300Mb) SysOp: Herb Mellinger. Silicon Lab. For Featuring MS/PC-DOS, over 3000 files. Verification required.
(813)882-0494 Tampa. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 96mb) SysOp: Ken Johnson. CAD Connection. For With Autocad, generic Cadd, Movies, Classified, Conferences. Sponsored by PC Consultants at Tampa.
(813)953-5505 Sarasota. Baud: 3/12/24, online: 24 hrs (disk space = 65Mb) SysOp: Charles Dittell. Suncoast City BBS. Using Postmaster for an advanced users BBS. with strong telecommunications. Online newsletter, humor, technical assistance.
(813)963-1900 Tampa. Baud: 3/12/24/96, online: 24 hrs (disk space = 40Mb) SysOp: Paul Streicher. Tampa Info Board. Using Quick Fidonet for on-line games, private messaging, files available.
(813)968-8000 Tampa. Baud: 3/12, online: 24 hrs SysOp: Jorge Toledo. American Business Brkr. For up/download listings of businesses 4-sale.
(904)260-9283 Jacksonville. Baud: 12/24, online: 24 hrs/7 days SysOp: George Frena. – Tech's Warehouse – . Using PC Board for support of IBM compatible systems. Latestin Public Domain files. Free technical support.
(904)285-8871 Jacksonville. Baud: 3/12, online: 24 hrs/7 days SysOp: Rick Stoner. STONER'S RETREAT. Using C-64 for Messages, up/ download.
(904)332-9547 Gainesville. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Jason Cook. Esoteric Oracle BBS. For system online over 2 years (30,000 calls).
(904)396-3064 Jacksonville. Baud: 12/24, online: 24 hrs/7 days (disk space = 160Mb) SysOp: Ed Krayer. DEMO (plus) tm. For Demo's of commercial Software packages dBase/Q Basic large PD section for IBM/compatible users.
(904)563-0704 Crystal River. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Jack Davis. Jack's Review. Using Nochange for over 500 programs to download for all systems, Up/downloads, mail, games. Open to all.
(904)642-6675 Jacksonville. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Bob Donovan. Sand Dunes. Using C-64C for messages, games, up/downloads.
(904)725-5435 Jacksonville. Baud: 3/12/24, online: 24 hrs SysOp: Charles McHan. Amy's Crystal Palace. For Kaypro 10, messages, online games, casino, multi-user.
(904)725-6175 Jacksonville. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Joan LeClere. Elsinore. Using Kaypro 10 for messages, games, contests, multiuser.
(904)743-9013 FPO Miami. Baud: 3/12/24, online: 24 hrs (disk space = 300Mb) SysOp: Bill Tomlinson. River City Nochange. For games, public domain U/D, doors. ANSI graphics. All computers welcome.
(904)765-5446 Jacksonville. Baud: 3/12/24, online: 24 hrs SysOp: Dave Girvan. Channel One. For messages, casino,online games, multi-user. No charge.
(904)862-9156 Ft. Walton Beach. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Jim Young. 221B Baker Street. Using At-class,Opus1.03b for MS-DOS, ANSI Graphics, Coleco Adam Sig (Echo Mail), Fido Net 366,221. Multiple messages. Free system.

Georgia

(404)296-3259 Decatur. Baud: 3/12/24, online: 24 hrs SysOp: Sergio Coppola. MIS-NET with Lee Collins. For NOVELL Networks. General IBM,MS-DOS, public domain software.
(404)320-6202 Decatur. Baud: 3/12/24/96, online: 24 hrs (disk space = 750Mb) SysOp: Bill Tullis. AV-Sync Atlanta. Using PD for IBM/Apple for special interest files & info for CAD, Electronics, TV, radio,FCC. 6 multilines.
(404)354-0662 Nicholson. Baud: 3/12, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Bob Herrin. FOG #27 with Scott Hartlage. Using Kaypro & Metal. **FOG member.**
(404)366-1914 Forest Park. Baud: 3/12, online: 24 hrs/7 days SysOp: Charles Dupree. TIBBS. Sponsored by Atlanta TI-99/4A Computer Users Grp. For (7-E-1) TI 99/4A users.
(404)498-4214 Stone Mountain. Baud: 12/24, online: 24 hrs (disk space = 32Mb) SysOp: Jeff Lehman. Micropolis BBS. Using Wildcat for MS-DOS related U/D only.Shareware & public domain. Sysop offers car & truck price quote service.
(404)733-3192 Augusta. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Hugh Echols. Four-ACES. Sponsored by Four Aces Users Group. For Atari computer enthusiasts.
(404)884-2575 Hagansville. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Dan Jones. TARA with Deboarah Barnes. Sponsored by LaGrange Area Micro Users Group. Using US Robotics TBBS for IBM compatible. U/D, protocall, shopping mall, movie gallery, grocery stores.
(404)991-6250 College Park. Baud: 3/12, online: 24 hrs/7 days SysOp: James A. Fairchild. 99er BBS. Sponsored by Atlanta TI-99/4A Computer Users Grp. For (7-E-1) TI 99 users, all.

Hawaii

(808)261-2184 Kailua. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Phil Musgrave. ACE-HI BBS. Sponsored by Atari Computer Enthusiasts of HI. Using ST BBS for original online games, newletters, Atari public domain software.

Iowa

(319)338-2961 Iowa City. Baud: 3/12/24, online: 24 hrs (disk space = 40 mb) SysOp: Andy Flatt. The NightHawk BBS. Using RBBS

Bulletin Boards

for U/D. All systems supported. All callers full access on first call. Zmodem supported.
(515)964-7937 Des Moines. Baud: 12/24/96, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Dan Buda. FOG-Line BBS with Anthony Clifton. Sponsored by **FOG** A.M.O. 12--Midwest FOG. Using OPUS & Fido for primarily as information source. Files are secondary. Verified users.

Idaho

(208)587-7603 Mountain Home. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: C. Walden. Rattlesnake Station. Using Atari 520 Michtron for message base, up/downloads, supports Atari ST, 8-bit, Macintosh, Commodore 64/128, IBM,Amiga.
(208)664-2983 Coeur d'Alene. Baud: 3/112/24, online: 24 hrs (disk space = 100Mb) SysOp: Jim Fromm. The Third Millennium. Using Wildcat for users of MS/PC-DOS. Live Programs, Validation needed to download. All computers welcome.

Illinois

(217)344-4032 Urbana. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 25Mb) SysOp: Jonathan Block. FOG #14. Using Osborne & Metal. **FOG member.**
(309)346-7736 Pekin. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Carl Frazier. Access Info system. Using Tandy 1000SX.
(309)347-1812 Pekin. Baud: 3/12/24, online: 24 hrs SysOp: Jim Segler. The Missing Link. For IBM and clones.
(309)347-6851 Pekin. Baud: 3/12, online: 9pm-9am SysOp: Dale Hackney. Using OPUS.
(309)662-6941 Bloomington. Baud: 3/12, online: 24 hrs/7 days SysOp: Garth Bock. Prairie Bulletin Board. Using TBBS for text library and games.
(312)282-9272 Chicago. Baud: 3/12/24, online: 24 hrs (disk space = 35Mb) SysOp: Daniel Majewski. Ski's Lodge. For 7 sub-boards, U/D, message bases. All computers welcome.
(312)295-6926 Lake Forest. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 150Mb) SysOp: David Alpert. Macropoedia BBS. Using Red Tyder Host for Macintosh. 15 DL. private mail, public mesage, shareware, freeware, public domain.
(312)301-2100 Orland Park. Baud: 3/12/24, online: 24 hrs (disk space = 200mb) SysOp: Rich Andrews. JOLNET with Dan Hone. Using AT&T 3B2, UNIX v5 for free Usenet feed, free shell access, BBS, party/chat modes, games, ul/dl. Amiga/Atari/IBM/UNIX.
(312)356-6897 Lake Villa. Baud: 3/12, online: 24 hrs/7 days SysOp: Paul Berker. Nessy Games System with Phyllis Berker. Using Apple IIE for Game menu w/ various adventure text games,NFL Football text game, etc. Message base also available.
(312)430-4234 Burbank. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Tim Orosz. Rune Quest BBS. Using BBS Express for role-playing games, microleague baseball, up/downloading for Atari ST & 8-bit.
(312)438-2234 Arlington Heights. Baud: 3/12/24, online: 24 hrs SysOp: Bill Budde. Harvest BBS. For IBM. 8bits, no parity, 1 stop bit.
(312)459-9331 Chicago. Baud: 3/12/24/48, online: 24 hrs SysOp: Brian Klimek. Turbo Bulletin Board. Using XTclone, OPUS.
(312)526-0642 Arlington Heights. Baud: 3/12, online: 24 hrs SysOp: Joe Zeinz. Harvest BBS. Sponsored by Northern Illinois Computer Society. Using 8N1 for Apple II users. Sponsored by Northern Illinois Computer Society.
(312)599-8089 Oak Lawn. Baud: 3/12/24, online: 24 hrs (disk space = 120Mb) SysOp: Vince D'Amore. Oak Lawn BBS with Chris Davis. For over 800 files and Z-modem transfer.
(312)622-4442 Chicago. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: George Matyaszek. Chicago Syslink Net. Sponsored by Chicago Area Computer Hobbyist Exch. For multi-user, online chat, Micromatch/Find-A-Friend, INFO-MAT weekly magazine, much more. **FOG member.**
(312)636-6694 Burbank. Baud: 3/12/24, online: 24 hrs (disk space = 78Mb) SysOp: Charles Valecek. Suburban Software BBS. Using PCBD for MS-DOS,doors, custom programming, online games. PC-Pursuitable.
(312)743-7729 Chicago. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Vaishnava Dasa. The Hare Krishna BBS. Using RBBS for Those who have an interest in the Vedic philosophy of Krishna. Open to the public & new users,No fee.
(312)777-9480 Chicago. Baud: 3/12, online: 6pm to 6am (disk space = 1Mb) SysOp: Kevin Keyser. The Round Table. Using Commodore for Some downloads useing PUNTER protocol. Extensive library section containing articles. 6 messages base.
(312)790-4688 Glen Ellyn. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Pat Mulcahy. The Generic BBS. Using FidoNet for online games, many SIGs, Commodore uploads/downloads. All are welcome.
(312)798-9150 Homewood. Baud: 110/3/12, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Jim Cameron. The Phoenix BBS with Doug Schuldt. Using Apple IIe GBBS PRO for PCP-accessible, Multiple Boards, Downloads, Online Games, E-mail. Also IBM, C'dore, Atari, CP/M.
(312)833-8126 Villa Park. Baud: 3/12, online: 24 hrs/7 days SysOp: Gerry Swetsky. VPNET. For Unix based system. Conferences. UUCP ddswl!vpnet!lisbon.
(312)833-8140 Villa Park. Baud: 3/12/24/19, online: 24 hrs SysOp: Gerry Swetsky. VNET. For featured AKCS linked conf. system. UUCP ddswl!vpnet!lisbon.
(312)896-9628 Aurora. Baud: 3/12, online: 24 hrs/7 days SysOp: Steven Lorenz. The B.A.S.I.C. BBS. Using TRS-80 I for Message Systems.
(312)934-6554 Palatine. Baud: 3/12/24, online: 24 hrs SysOp: Rose Gibbney. Rational Tech BBS. For latest info on the technical developments at Rational Technologies, Inc.
(312)964-5496 Lisle. Baud: 3/12/24, online: 24 hrs (disk space = 30Mb) SysOp: Glenn Cerny. Midwest Pc Board Exch. Using PCB 12.1 for sysops conf. No change but do keep a fair upload ratio.
(815)429-3533 Donovan. Baud: 3/12/24, online: 6pm to 6am SysOp: Wayne Burgess. Alternative Universe. For IBM, Commodore, and TI computer support. Large download section.

Indiana

(219)223-8107 Rochester. Baud: 3/12, online: 24 hrs/7 days SysOp: Mark Timbers. Manitou BBS. Sponsored by Rochester Commodore Computer Club. For downloads for ATARI, Commodore. Telecomputing News, Info-Mat, Zip Beep. Open to all computers.
(219)447-3011 Fort Wayne. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Mark Taylor. The Fire Department with Ron Whitney. Using Wildcat for most popular machine types. U/D, some games. Reg required.
(219)522-1149 Elkhart. Baud: 12/24/96, online: 24 hrs SysOp: Derry Nelson. – 1149 – . Sponsored by Elkhart PC User Group. Using PCBoard.
(219)563-1738 Wabash. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: Norm Benjamin. Wabash RBBS. For IBM, MS-DOS, and compatibles. Registration required for full access.
(219)696-3415 Lowell. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 120Mb) SysOp: Ken Prevo. dBASICs Toolkit. Using Eagle PC PC Board for specialty:MicroSoft Basics-Btrieve. Also product support and upgrades to Shareware.
(317)284-0920 Muncie. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Adam Yoder. MMug BBS with Greg Durst. Using 8/N/1 Fido for discussions and public-domain software. For IBM, TRS-80, Model 100, CoCo.
(317)525-6920 Waldron. Baud: 3/12, online: 24 hrs (disk space = 40Mb) SysOp: Mike Phillips. The Catacomb BBS. Using Quick BBS V. 2.01 for generally free board. Net and echomail available to supporting members. Christian Echo by request.
(317)783-0182 Indianapolis. Baud: 3/12, online: 24 hrs (disk space = 1Mb) SysOp: Don DuKate. Ivory Joe BBS with John Cox. Sponsored by Indianapolis Computer Club, Inc.. Using Punter for E-mail options and sub boards. on-line library.
(317)843-2855 Carmel. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Shawn Steiner. Indianapolis Business. Using PC-Board 11.9 for Business BBS, Caries INFOMAT & Software Showcase.
(812)477-5343 Evansville. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 160Mb) SysOp: Ben H. Nation. NationServ. Sponsored by Nationserv Users Group. Using Tandy 1200HD,PCB for IBM, Commodore, Tandy, & others. Up/downloads available, plus online games. Home of USA BBS listings.
(812)479-1310 Evansville. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 70Mb) SysOp: Gary Barr. Digicom BBS. Using Michtron for IBM, Amiga, Atari 8/16-bit, Apple, Tandy and C-64. 16 online SIGS, movie reviews, text libs & more.

Kansas

(913)238-8725 Junction City. Baud: m/12, online: 24 hrs (disk space = 20Mb) SysOp: Dave Springs. Advantage BBS. Using PCBoard for MS-DOS. Conferences for writers * police officers. Open to all, immediate downloads available.
(913)287-5843 ??. Baud: 3/12, online: 24 hrs (disk space = 4Mb) SysOp: R Dudley. SOFTLIBRARY. Sponsored by Greater Kansas City SysOps Assoc.. Using BBS-64 for Commodore and compatibles. 1200 baud is even parity, 7 data bits, 1 stop bit. Adults only. **GKCSA member.**
(913)334-0606 Bethel. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Bob Tate. Town Crier. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS for IBM and compatibles.
(913)334-5511 ??. Baud: 3/12, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Bob Tate. K.C.K.C.C.. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 14.1 for IBM and compatibles. **GKCSA member.**
(913)341-4553 Overland Park. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: D Gerrity. KC R-HP UG. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 14.1 for IBM and compatibles. Hewlett Packard Users Group. Mail in registration required for full access. **GKCSA member.**
(913)384-0932 Prairie Village. Baud: 300, online: 24 hrs SysOp: Jimmy Morrow. SM 512. Sponsored by Greater Kansas City SysOps Assoc.. Using PBBS for Apple/Macintosh and compatible systems.
(913)422-7345 Bonner Springs. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 31Mb) SysOp: J Rickey. COSMIX STA. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 15.1 for IBM and compatible. Voice or other verification required for full access. **GKCSA member.**
(913)432-0213 ??. Baud: 3/12, online: 24 hrs SysOp: V. Mahorney. Smokers Den. Sponsored by Greater Kansas City SysOps Assoc.. For Commodore and compatible systems. Amigas from 6 pm-6 am.
(913)469-2301 ??. Baud: 3/12/24/19, online: 24 hrs/7 days (disk space = 120Mb) SysOp: Jeff Kosko. JCCC BBS #1. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD 12.1 for IBM and compatibles. Mail in registration required for full access. 7 on lines. 19200 Fastcomm. **GKCSA member.**
(913)492-2089 Overland Park. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 44Mb) SysOp: R Kern. SMART SYS #1. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD 11.8 for IBM and compatibles.2 on lines.Voice or other verificsation req. for full access. Semi-private. **GKCSA member.**
(913)492-7291 Overland Park. Baud: 3/12/, online: 7 pm to 7 am SysOp: B Crosier. TANDY BBS. Using RBBS 14.1 for IBM and compatibles. Voice or other verification required for full access. **GKCSA member.**
(913)539-9312 Manhattan. Baud: 3/12, online: 24 hrs/7 days (disk space = 240Mb) SysOp: Dennis Haza. Flint Hills BBS. Using AT clone, PC-Board for IBM & compatibles.
(913)541-0561 Lenexa. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Bill Atchison. Bizarre HQ. Sponsored by Greater Kansas City SysOps Assoc.. Using BBSP for 100 files. Specialty is Commodore.
(913)621-4354 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 95Mb) SysOp: Takestani. DONNELLY CO. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD 12.1 for IBM and compatible. Mail in registration required for full access. **GKCSA member.**
(913)642-7401 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Gary Miller. EXCALIBUR. Sponsored by Greater Kansas City SysOps Assoc.. Using TBBS2.0 for IBM and compatibles. Voice or other verification required for full access. **GKCSA member.**
(913)642-8479 ??. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 80Mb) SysOp: M Russell. EPSON-NET. Using UBBS-II for IBM and compatibles. 9600 is US Robotics. **GKCSA member.**
(913)764-6451 ??. Baud: 3/12/, online: 10 pm to 7 am (disk space = 1.2Mb) SysOp: P.J. Slicer. MANHATTAN. Sponsored by Greater Kansas City SysOps Assoc.. Using TI-Net for TI and compatibles. 1200 Baud is even parity,7 data bits, 1 stop bit. **GKCSA member.**
(913)782-9628 ??. Baud: 3/12, online: 24 hrs SysOp: Jack Baker. Grapevine. Sponsored by Greater Kansas City SysOps Assoc.. Using EBBS for Commodore and compatible systems.
(913)825-6830 Salina. Baud: 3/12, online: 7pm to 9am Central SysOp: Sam Laffere. Cloud 9ine BBS with Robert Davis. For Apple, Atari, Commodore, MS-DOS. Editorials, message bases.
(913)829-2546 Olathe. Baud: 3/12, online: 24 hrs (disk space = 40Mb) SysOp: Ray Brandt. Carnival. Sponsored by Greater Kansas City SysOps Assoc.. Using EBBS for all computers. 200 files.
(913)829-5417 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: T Leckbee. TEL-KC. Using RBBS 15.1 for IBM and compatible. Voice or other verification required for full access. Optional sub. available. **GKCSA member.**
(913)831-4111 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: John Floyd. MID-AMERICA. Using RBBS 15.1 for IBM and compatibles. **GKCSA member.**
(913)888-4918 ??. Baud: 3/12, online: 9 pm to 7 am (disk space = 20Mb) SysOp: J Portche. KC-BBS. Using RBBS 15.1 for IBM and compatibles. **GKCSA member.**
(913)888-6301 Overland Park. Baud: 3/12/, online: 24 hrs SysOp: Chris Lemon. E.C. Online. Sponsored by Greater Kansas City SysOps Assoc.. Using Quik for IBM and compatibles.

Kentucky

(502)241-4109 Crestwood. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Curt Edwards. Soft Stone. Using XT clone & RBBS for FOG Remote System #24. **FOG member.**
(502)267-7422 Jeffersontown. Baud: 3/12, online: 24 hrs (disk space = 30Mb) SysOp: Dennis Deckmann. Deckmann's Exchange. Using GT Power for several Echo Confernce, net mail, Ansi Music.
(502)678-5292 Glasgow. Baud: 3/12, online: 24 hrs/7 days (disk space = 1Mb) SysOp: Larry Stell. Better BBS of KY.
(606)293-0154 Lexington. Baud: 3/12/24, online: 24 hrs (disk space = 78Mb) SysOp: Phil Baughn. Central Kent Computer with Paul Stackhouse. Sponsored by Central KY Computer Society Inc. Using RBBS on XT for IBM, compatibles, Apple][, Macintosh, Kaypro, CP/M. Conf &files. AutoCad.Graphics. Membership Req.
(606)754-4636 Elkhorn City. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Frank Belcher. Kace ST BBS. For ST PD and shareware software. MS/DOS PD files.
(606)781-4478 Southgate. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Ron Otto. Ruppel-Set II. Using PCBoard 12.1 for specializing in Desktop Publishing, HP Laser Jet utilities, Ventura 1.1.
(407)338-8486 Boca Raton. Baud: 3/12/24, online: 24 hrs (disk space = 120Mb) SysOp: Bill Wright. PC Logic Wildcat!. Using Wildcat for ham radio and communications oriented.

Louisiana

(318)234-8310 Lafayette. Baud: 3/12/24, online: 24 hrs SysOp: Bill Herron. Bayou Basin

DYM BBS. For Dial-Your-Match functions, use Oracomm. All new users welcome.
(318)281-7735 Bastrop. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Pat McMullan. THE I/O BUS BBS. Using RBBS for downloads for IBM,TRS-80, Commodore, Atari, TI & Apple. Conferences, jokes,IBM & Ham.
(318)322-8747 West Monroe. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: Bill DeLoach. The 8-bit Express!. Using BBS Express for Multi discussion, scubs, photography, arts & crafts,financial. MS-DOS, Commodore, Atari.
(318)387-9470 West Monroe. Baud: 300, online: 5:30 pm to 7:00 am SysOp: Bob Thodes. Best In Town-BIT with Danny Bray. Using ML-BBS for MS-DOS. multi-user function. General interest.8N1.
(318)396-4627 West Monroe. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Danny Bray. The Missing Link with Dewayne Duncan. Using Phoenix, Tandy for IBM and compatibles. All welcome.
(318)397-2546 West Monroe. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Carol Hodo-Slone. The ASCII Gazette. Using Phoenix BBS for multiple discussion areas, MS/DOS files.
(318)442-8210 Alexandria. Baud: 3/12/24/96, online: 24 hrs (disk space = 1.2Gb) SysOp: Scott Benge. The National Board with Joel Aud. For open access to all, color graphics supported. Free nationwide ads for Sysops.
(318)474-4367 Lake Charles. Baud: 3/12/24, online: 24 hrs SysOp: Chick Hawsey. The Workshop BBS. For IBM and compatibles.
(318)949-1456 Shreveport. Baud: 3/12/24/96, online: 24 hrs/7 days SysOp: Tony Capoccia. Bible Bulletin Board.
(504)340-5603 Marrero. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Paul Arnold. TI-Net #4. Using TI-99/4A for TI-99 and other computers. Small users fee.
(504)340-7876 Marrero. Baud: 3/12/24, online: 24 hrs (disk space = 2.14M) SysOp: Robert Goslin. The Silicon Swamp. Using BBS Express for Downloads to Atari 8-bit mostly.
(504)649-3872 Slidell. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Phil Catarella. A.P.E.S.. Sponsored by. Using Atari for download sections for Atari, 8 and 16 bit and Amiga.
(504)649-7921 Slidell. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Doug Cushing. Slidell Express. For Commodore, Atari, Apple.
(504)766-8212 Baton Rouge. Baud: 3/12/24, online: 24 hrs (disk space = 106Mb) SysOp: Michael James. Krystal Palace BBS. For adventure gaming. IBM/ Compatibles, Atari-ST.
(504)775-9636 Baton Rouge. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Rob Collins. The Emerald Forest. Using WWIV for online games, messages for IBM, Atari-ST, Commodore.
(504)928-7466 Baton Rouge. Baud: 3/12, online: 24 hrs/7 days (disk space = 10mb) SysOp: Mark Chambers. The Batboard. Using TRS-80 3/TBBS for messages, discussion and software downloads. Adult msgs/dl. Free validation for long-distance.

Massachusetts

(413)567-1822 Longmeadow. Baud: 3/12/24/96, online: 24 hrs (disk space = 500Mb) SysOp: Tracey Carman. /Top Cat/. Using US Robotics for MS/PC-DOS based programs. Some CP/M. Subscription based.
(413)736-0667 Springfield. Baud: 3/12, online: 24 hrs/7 days SysOp: Edward Goldberg. Mass. Gold Mine. Sponsored by Pioneer Valley 99/4A Users Group. Using TI-99/4A for Download sections for IBM, TI, Commodore, Atari, Apple.
(508)222-4979 Norton. Baud: 3/12, online: 24 hrs SysOp: Mike Petersen. Twilight Zone 2001. Using Commodore for many message bases, U/D, online games. Specializing to Commodore 64/128 but all welcome.
(508)429-1784 Holliston. Baud: 3/12/24, online: 24 hrs (disk space = 240Mb) SysOp: Pete White. Using TBBS v 2.1 for humor, ham, MS-DOS, Amiga, Atari, Commodore, Macintosh.
(508)756-1442 Webster. Baud: 3/12, online: 24 hrs (disk space = 5Mb) SysOp: Richard Bostock. Gosub BBS. Sponsored by Gosub Personnal Computer Users Grp.
(508)853-4079 Worchester. Baud: 3/12/24, online: 24 hrs (disk space = 104Mb) SysOp: Richard Kenadek. IVY BBS. For Atari, Apple, Commodore, IBM, TRS-80, Amiga.
(508)865-0498 Worchester. Baud: 3/12/24, online: 24 hrs SysOp: Richard Kenadek. Davy Jones Locker. Using IVY 80386-20 for Free Fidonet Mail to any BBS in Eastern Massachusetts.
(508)922-7438 Somerville. Baud: 3/12/24, online: 24 hrs (disk space = 65Mb) SysOp: Rick Pitts. Classics Best BBS. Using PCBoard for P/D file transfer. For IBM and compatibles.
(617)229-2345 Burlington. Baud: 3/12/24, online: 24 hrs SysOp: Karen Young. Argus Computerized Ex. For Sortable Directory of BBS/User Groups & forum/Shareqare/free software,CHAT,electronic mail. 5 lines.
(617)247-3048 Boston. Baud: 3/12/24, online: 24 hrs SysOp: Susan Goode. INFO Online. For travel/vacation info. Computers for sale. Educaton, Calendar of events. Stock quotes (15 min. delay).
(617)288-4667 Boston. Baud: 3/12, online: 24 hrs/7 days (disk space = 35Mb) SysOp: John Kinsella. Bar-Ken (FOG 29) with Barbara Kinsella. Sponsored by **FOG** A.M.O. 122--Boston Osborne Group (BCS SIG). Using Osborne & Metal. **FOG member.**
(617)329-8528 Dedham. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30 mb) SysOp: Russell Boyce. CUS-VT #3. Using Televideo 806 for multi-user, multi-tasking open access system. A super CP/M BBS!.
(617)479-3432 Wollaston. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Robert F. Connolly. The Unicorn's Inn TBBS. Using IBM/TBBS for public-domain library.
(617)540-6948 Falmouth. Baud: 3/12, online: 24 hrs/7 days SysOp: Donald Ross. Ecalpon BBS. Using QuickBBS for MS and IBM DOS, EMail and Bulletins, free PD up/downloads, no membership fees, New members Welcome.
(617)686-5735 Boston. Baud: 3/12/24/96, online: 24 hrs SysOp: Kenyon Kary. 80-Boston BBS. Sponsored by The Boston Computer Society. For info about Tandy Radio Shack User Group.
(617)862-5779 Boston. Baud: 3/12, online: 24 hrs/7 days SysOp: John Premack. BCS/CUG BBS. Sponsored by Commodore Users Group (BCS SIG). For all users. Registration required.

Maryland

(301)228-4828 Cambridge. Baud: 3/12/24, online: 24 hrs SysOp: Bob Willey. CCS Technical Support. For IBM, MSDOS public domain software.
(301)343-1102 Freeland. Baud: 3/12/24, online: 24 hrs SysOp: Michael Huggins. The Fisherman's Cove. Using RBBS for public domain files, games. Doors available after 24 hrs after log on.
(301)345-7459 College Park. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: George Falcon. The Falcon's Rock Opus. Using Opus for info on Mensa. Vietnam Era Vet's Echo Con, Women Vet's conf, MIA-POW Echo conf. Small fee.
(301)596-1044 Columbia. Baud: 3/12/24, online: 24 hrs SysOp: Bob Hoffman. Harvester. Using TBBS for Christian downloads/ Fidonet compatible.
(301)760-2483 Glen Burnie. Baud: 3/12/24, online: 24 hrs (disk space = 54Mb) SysOp: Joe Tech. AmigaBase. Using BBS-PC for Amiga computers only. PD utilities, instant access.
(301)862-2633 Lexington Park. Baud: 3/12/24, online: 6:30am to 6:30pm SysOp: Mike Taylor. VQ4 PC User Group RBBS. Sponsored by VQ-4pc Users Group. For MS-DOS and Commodre.

Maine

(207)439-9367 Kittery Point. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 200Mb) SysOp: Bill Thomas. SeaCoast Opus. Using AT-clone, Opus for IBM, HP LaserJet, DEC Rainbow, Turbo Pascal, Accounting, Database, FidoNews, PC-Gazette. Conferences.
(207)465-9065 Fairfield Center. Baud: 3/12, online: 24 hrs/7 days SysOp: Eunice Spooner. with Erik Rushton. Using TI-99/4A TIBBS for TIBBS for the TI 99/4A and any computer,Emphasis on exchanging prog.building a message base.
(207)490-2870 Sanford. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Michael Lescord. TreeTops BBS. For Atari St, 8-bit, Amiga, Commodore, IBM Coco, TI and others.

Michigan

(313)242-0063 Monroe. Baud: 3/12, online: 24 hrs (disk space = 40Mb) SysOp: Rodney Lux. Innerforce Communic. Using C-Net 12.0 for online games, P.files forC-Net owners. Massive U/D. Mainly Commodore but support all systems.
(313)242-1247 Monroe. Baud: 3/12, online: 24 hrs (disk space = 32Mb) SysOp: Rob O'Dell. Computer Alley BBS. Using RBBS 16.1 for online games, conf. Mainly MS-DOS/IBM, boards for Aple, Commodore, and Amiga.
(313)263-4680 Clinton TWP.. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 1500M) SysOp: Rick Wadowski. Clinton Microlink. Using IBM & RBBS for PC-SIG, IBM software, general interest Sigs.
(313)443-0365 Southfield. Baud: 3/12, online: 24 hrs/7 days (disk space = 21Mb) SysOp: Bill Rice. Cold FOG System. Sponsored by **FOG** A.M.O. 14--DEtroit FOG. Using Osborne & Metal for FOG Remote System #26. **FOG member.**
(313)629-2854 Fenton. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Thomas Walker. Fenton TBBS. Using TRS-80 III, TBBS for 7/N/1 and 8/N/1. Member of the BBS Press Service and the Financial Update Network.
(313)736-3920 Flint. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Jerry Cross. Facts BBS. Sponsored by Genesee Atari Group. For all computer types. Full access for all. Several SIG groups.
(313)981-6150 Dearborn. Baud: 3/12/24, online: 24 hrs SysOp: Ken Pletzer. Future World. For sales and support.
(517)337-0261 East Lansing. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Warren Wolfe. Data Basics RBBS. Using RBBS-PC N81 for specialty languages in Turbo Pascal, dBASE, C, assembler. Technical assistance to PC/MS-DOS.
(517)371-1106 Lansing. Baud: 3/112/24, online: 24 hrs SysOp: John Nagy. CHAOS. Sponsored by Capitol Hill Atari Owners Society.
(517)496-2093 Midland. Baud: 3/12, online: 24 hrs SysOp: Mark Ratcliffe. Midland Area BBS. Sponsored by Midland Commodore Computer Club. For electronic mail, club news, questions & answers. Sale &swap. UL/DL. Commodore 64/128.
(616)235-2313 Grand Rapids. Baud: 3/12/24, online: 24 hrs (disk space = 65Mb) SysOp: Rodney Faulk. The Realm. Using Forem ST for Atari ST, Amiga, MS-DOS. Online games, specialized areas for adults & children only.
(616)335-8044 Holland. Baud: 3/12/24, online: 24 hrs SysOp: Richard Brockmeier. Multi-Board. Using BBS-PC for Amiga computers. 700 messages, FISH ABSTRACTS plus 600 files.
(616)342-8104 Kalamazoo. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Michael Richardson. Bathroom Wall BBS with Jason Paupore. Using Elite plus I for everything from psychics to cars and music. This board rocks.
(616)962-0400 Battle Creek. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Harmon Ruble. B.C. Central. For large download files for all computers.

Minnesota

(507)289-8211 Rochester. Baud: 3/12, online: 24 hrs/7 days (disk space = 20 Mb) SysOp: John Pritchard. RAMS. Using Major BBS for U/D, teleconfernces, games. 3 lines.

Missouri

(314)625-4054 Lake St. Louis. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 680Mb) SysOp: Richard Brown. Travel * Online. Using PC Board for A FREE electronic forum for the exchange of travel info. PCB-ECho Network, QwikMail archived mess.
(314)634-8219 Jefferson City. Baud: 3/12/24, online: 24 hrs (disk space = 150Mb) SysOp: Kevin Mullally. Vote Technologies BBS. Using Wildcat for MS-DOS, some Mac software. Specialize in desktop publishing, high quality graphics. 8-N-1.
(314)928-9228 St. Charles. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Terry Mueller. FidoNet/Seadog BBS. Sponsored by St. Peters Area computer Enthusiast. Using FidoNet for info about the group. Emphasis on PC compatibles. Some DL and message available to members only.
(417)532-6613 Lebanon. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Ed Barrett. Oasis Lebanon. Using WWIV for lotus 123 applications, print media consulting. Voice or other verification req for full access.
(417)869-5294 Springfield. Baud: 3/12/24, online: 24 hrs/7 days SysOp: James Morris. The Computer Matrix. Using Tandy for Tandy, IBM and Apple.
(816)221-0475 Kansas City. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Art Gentry. Unix-BBS. Sponsored by Greater Kansas City SysOps Assoc.. Using UNIX for IBM and compatibles. Unix.
(816)229-1841 Blue Springs. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 142Mb) SysOp: Gary Wood. KC- Passport. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD 12.1 for IBM and compatibles. **GKCSA member.**
(816)233-9186 ??. Baud: 3/12/24, online: 6 pm to 7 am (disk space = 30 Mb) SysOp: Mike Fuson. CMOS OPUS. Sponsored by Greater Kansas City SysOps Assoc.. Using Opus for IBM and compatibles. **GKCSA member.**
(816)241-8869 ??. Baud: 3/12/24/96, online: 24 hrs (disk space = 130Mb) SysOp: Joe Taibi. Transient T. Sponsored by Greater Kansas City SysOps Assoc.. Using Quik for IBM and compatibles. Fidonet.
(816)257-4675 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 28Mb) SysOp: Kovachevch. Show-Me BBS. Using RBBS 15.1 for IBM and compatibles. **GKCSA member.**
(816)274-2603 ??. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: R Lovett. CITY HALL. Sponsored by Greater Kansas City SysOps Assoc.. Using Fido-11A for IBM and compatibles. KCMO info. **GKCSA member.**
(816)373-6447 Independence. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: D Green. IT'S ALIVE. Sponsored by Greater Kansas City SysOps Assoc.. Using BBS-PC for IBM and compatibles specializing in communications. Voice or other verifications for full access. **GKCSA member.**
(816)436-2843 Gladstone. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: D. Blackwell. Maplewoods. Sponsored by Greater Kansas City SysOps Assoc.. Using OPUS for IBM and compatibles.
(816)436-2904 Gladstone. Baud: 3/12/24, online: 24 hrs (disk space = 66Mb) SysOp: Jerry Oliver. Frisky CoCo. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS for Tandy.
(816)453-2237 ??. Baud: 3/12, online: 24 hrs (disk space = 8Mb) SysOp: Earl Goldberg. CCentral UG. Sponsored by Greater Kansas City SysOps Assoc.. Using PUNT for Commodore and compatible systems. Fee required.
(816)454-4448 Kansas City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 110Mb) SysOp: L Clouse. US-BBS #1. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBS 12.1 for IBM and compatibles. Voice or other ver. for full access. Optional sub. available. 3 on lines. **PRACSA member.**
(816)454-5042 Kansas City. Baud: 3/12/24/96, online: 24 hrs (disk space = 70Mb) SysOp: Doug Loughery. Pegasus. Sponsored by Greater Kansas City SysOps Assoc.. Using OPUS for IBM and compatibles. Fidonet.
(816)455-2467 ??. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Ray Stenard. First Amend. Sponsored by Greater Kansas City SysOps Assoc.. Using RCBD for IBM and compatibles.
(816)455-2589 ??. Baud: 3/12/24/96, online: 24 hrs (disk space = 20Mb) SysOp: P. Leonard. W.D.I.A.. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS for IBM and compatibles.
(816)459-7327 ??. Baud: 3/12/, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Jim Boling. KITTY HAWK. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD 10.0 for IBM and compatibles. **GKCSA member.**
(816)468-5114 ??. Baud: 3/12, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Spiegelhlr. BOARDROOM #2. Using RBBS 15.1 for IBM and compatible systems. Games. **GKCSA member.**
(816)468-5374 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60 Mb) SysOp: Spiegelhlr. BOARDROOM #1. Using RBBS 15.1 for IBM and Compatible systems. General use. **GKCSA member.**

Bulletin Boards

(816)471-6691 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 140Mb) SysOp: O Kinder. MIDWEST TYP. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 15.1 for IBM and compatibles. **GKCSA member.**

(816)537-7675 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: D Franklin. DATA BANK. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD 12.0 for IBM and compatible. General info. **GKCSA member.**

(816)561-3650 ??. Baud: 3/12/24, online: 6pm-6am/ 7 days (disk space = 20Mb) SysOp: Tom Crane. MID-COAST. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 15.1 for IBM and compatibles. KKFI. **GKCSA member.**

(816)588-1998 ??. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Doug Felts. Doctalk. Sponsored by Greater Kansas City SysOps Assoc.. Using TBBS for 100 files. Specialty area is medical.

(816)637-4183 ??. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: Art Gentry. BEDROOM #1. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD 12.1 for IBM and compatibles. Adults only. Mail in reg. req. for ful access. Optional sub. are available. **GKCSA member.**

(816)637-6163 Excelsior Spring. Baud: 3/12/24, online: 24 hrs (disk space = 50Mb) SysOp: S. Hohbaum. Lair of S.D. Sponsored by Greater Kansas City SysOps Assoc.. Using BBSX for Atari and compatible systems. Nonlocal.

(816)734-5202 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: T Raniere. C-SHOPPE. Using PCBD 12.0 for IBM and compatibles. Voice or other ver. req. for full access. Optional subscriptions are available. **GKCSA member.**

(816)763-5019 ??. Baud: 3/12, online: 8am-5pm/7 days SysOp: Tulowitsky. Trinity BBS. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD for IBM and compatibles. Specialty area is religion.

(816)765-4227 Kansas City. Baud: 3/12, online: 24 hrs SysOp: D Powell. LOTTERY CEN. Sponsored by Greater Kansas City SysOps Assoc.. Using Bizarre 64 for Commodore and compatibles.Messages only. **GKCSA member.**

(816)833-0537 ??. Baud: 3/12, online: 5pm-10pm/7 days (disk space = 20Mb) SysOp: D Reimer. Independence. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 14.1 for IBM and compatibles. **GKCSA member.**

(816)833-3410 ??. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 60Mb) SysOp: M Browning. A.I. BBS. Using OPUS 1.03 for IBM and compatible systems. General areas. 9600 baud is US Robotics. **GKCSA member.**

(816)891-6659 Parkville. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: M. Fischer. Maxon Sys.. Sponsored by Greater Kansas City SysOps Assoc.. Using PCBD for IBM and compatibles.

(816)931-1726 ??. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Ted Kihm. COWORKS BBS. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 15.11 for IBM and compatible. **GKCSA member.**

(816)942-9287 Kansas City. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Dave Kadel. South K.C.. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS for IBM and compatibles. 200 files for downloading.

(913)236-4672 Kansas City. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: D Sawyer. OTHER BBS. Sponsored by Greater Kansas City SysOps Assoc.. Using RBBS 15.1 for IBM and compatibles. Voice or other verification required for full access. **GKCSA member.**

(913)236-6530 Kansas City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Bruce Heck. COMP-SPEC. Using PCBD 10.1 for IBM and compatibles. Voice or other verification required for full access. **GKCSA member.**

Mississippi

(601)372-7481 Jackson. Baud: 3/12/24, online: 24 hrs (disk space = 100Mb) SysOp: Jimmy Bowen. Little Christmas Tree. For MS-DOS, online discussions, messages.

(601)373-2269 Jackson. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: David Dent. MCS-Expansion BBS. Sponsored by **FOG** A.M.O. 58--Mississippi Computer Society. Using OPUS for MS-DOS with some CP/M, dBASE, PASCAL. Only the CHOICE software.

(601)746-2132 Yazoo City. Baud: 3/12, online: 24 hrs SysOp: Steven Standley. The Informer BBS. Using RBBS-PC for exchange of information through either PD or Shareware programs.

Montana

(406)228-8794 Glasgow. Baud: 3/12/24, online: 24 hrs (disk space = 156Mb) SysOp: Steph Ricciardelli. The Homeport BBS. Using 8-N-1 for DL files.

(406)385-2638 Westby. Baud: 3/12, online: 24 hrs (disk space = 10Mb) SysOp: Mark Onstad. ONS-80 BBS. For IBM, TRS-80, Commodore support.

(406)442-7713 Helena. Baud: 3/12/24, online: 24 hrs SysOp: Bob Romney. Dos Utilities Exchange. For IBM/MS-DOS environment. File up/downloads. No fee.

(406)443-2768 Helena. Baud: 3/12, online: 24 hrs SysOp: Marion Thompson. Helena Valley Remote. For CP/M systems. Sponsored by Applied Management Corp. No fee.

(406)543-8110 Missoula. Baud: 3/12, online: 24 hrs/7 days SysOp: Skip Leininger. Montana. Sponsored by Rattlesnake Atari Computer Enthusia. For uploads and downloads use Atari.

North Carolina

(704)264-0674 Boone. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Michael Pejsach. The SPHTM-HEEF BBS. Using IBM-PC for Apple, Macintosh and IBM software online. Software, health resources.

(704)527-6999 Charlotte. Baud: 3/12/24/96, online: 24 hrs./7days SysOp: Alex Popper. CACC BBS. Sponsored by Charlotte Apple Computer Club. For General and Apple II boards open to public, other boards and downloads available to club members.

(704)652-1801 Nebo. Baud: 12/24, online: 8 pm -12 am EST (disk space = 20Mb) SysOp: Mark Tokay. . For nationwide job listings for software/hardware eng. Jobs, tips, employment opp. UPDATED DAILY.

(704)865-7126 Gastonia. Baud: 3/12/24, online: 24 hrs (disk space = 125Mb) SysOp: Jim Eddings. The Eclectic Board with Bruce Keever. Using RBBS-PC 15.1C for on-line downloading. Files primarily for the MS-DOS computers. Reg. for downloading. E-Mail.

(704)937-7736 Grover. Baud: 3/12, online: 24 hrs (disk space = 30Mb) SysOp: Jeff Ward. Futura BBS with Bill Vaughan. Using TUBBS for CoCo,IBM/ compatibles, Commodore, Adult SIG. Downloads.

(919)338-0236 Elizabeth City. Baud: 3/12, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Gordon Cameron. Canal Bank Four B.B.S.. For Apple, Atari, Commodore, MS-DOS, CP/M, Radio Shack. On-line games: trade wars and wheel of fortune.

(919)383-8707 Durham. Baud: 3/12/24, online: 24 (disk space = 32Mb) SysOp: Roy Gurley. Bull City BBS with Shirley Gurley. For UL/DL for IBM/clones, C-64, C-128 and TI99/4A's. Online games, color menus.

(919)471-6255 Durham. Baud: 12/24/96, online: 24 hrs (disk space = 174Mb) SysOp: Jim Neumann. The Backroom BBS. Using Wildcat for USA/Today Newspaper, online games, no fees, message base.8-N-1. Simulates the Roaring 20's.

(919)492-4453 Henderson. Baud: 3/12, online: 24 hrs/7 days SysOp: Michael Frend. MICROMASH. For uploads, downloads. All computers welcome.

(919)726-9737 Newport. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Chuck Katsekes. The Dungeon BBS. Using Colofama 4.0. RYBB for IBM, Tandy, CoCo, Commodore, Atari, Amiga, TRS-80, Apple, Macintosh. 8-N-1.

(919)779-6674 Raleigh. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 218Mb) SysOp: Mike Stroud. Micro Message Service. Using Nova's 286 10MHz for Amiga, Atari ST, MS-DOS & OS/2, Macintosh, Apple, Lap Tops, C-64/128, CoCo, & TRS-80. 5 lines.

North Dakota

(701)293-5973 Fargo. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 150Mb) SysOp: James. Grettum. RBBS PC of Fargo Inc. Sponsored by Fargo IBM PC Users Group. Using RBBS-PC for IBM Software, Programming, Lotus, Law. Online since July 83, supports 3800 users on 4 nodes.

Nebraska

(402)280-4280 Omaha. Baud: 3/12 8N1, online: 24 hrs SysOp: Dr. T. Host. Medical BBS with Dr. W. Kirchain. For all consumers of healthcare. Medication Monographs, answers to medication-related questions.

(402)558-4745 ??. Baud: to 19,200, online: 24 hrs (disk space = 70Mb) SysOp: Rivaldo Rustam. Intrada BBS. Using Opus-CBCS 1.03b for 22.

(402)593-9188 Omaha. Baud: 3/12, online: 24 hrs/7 days SysOp: Johnny Green. Malachi's Burden BBS with Sherman Smith. Using Michtron BBS 2.0 for Christian BBS. Fundamentals from KJV. 50 ASCII download files w/email, 12 SIGs, Xmodem downloads.

New Hampshire

(603)432-6711 Londonderry. Baud: 3/12/24, online: 24 hrs SysOp: Gardiner Jones. Nor' Easter BBS. Using PCB 12.0 for conferences. on-line reg required. 8/N/1.

(603)647-3044 Manchester. Baud: 3/12/24, online: 24 hrs (disk space = 80Mb) SysOp: Jim Webb. Granite State Connecti. Using Quickbbs 2.1 for U/D, online user competive games. Ansi Color Graphics,E-Mail,Net-Mail.

(603)893-2078 Salem. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 102Mb) SysOp: Tom Theriault. Token Warrior BBS. Using Phoenix for many files to download for IBM and compatibles.online games. No fees.

(603)898-6433 Salem. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 65Mb) SysOp: Steve Dudley. The Crash Cart BBS. Using Wildcat for IBM,PC, color graphics, message bases, file transfers, online games and net mail.

(603)922-5226 Groveton. Baud: 3/12/24, online: 4 pm-6:30 am M-F SysOp: Donna Burge. Angel's Byteways. Using Quick BBS for IBM and compatibles.

New Jersey

(201)229-8650 Oakhurst. Baud: 12/24/96, online: 24 hrs (disk space = 500Mb) SysOp: Jim Sura. Designed Letters BBS. Using PC Board for IBM and compatibles. Doors to DOS. 3 nodes. RLE graphics. PC pursuitable. Conferences.

(201)233-9148 Westfield. Baud: 3/12, online: 24 hrs/7 days (disk space = 1.7Mb) SysOp: Dave Grabowski. The Tarantula's Nest. Using Commodore,C-Net for C64 & C128, all computers welcome, PC Pursuitable. Message base.

(201)239-1346 Verona. Baud: 12/24, online: 24 hrs/7 days (disk space = 120Mb) SysOp: Mark Rapp. MicroSellar BBS. Using IBM & PC-Board for IBM/compatibles, Info-Mat/PC-Gazette affiliate, PC-Pursuitable, Software reviews, Doors to DOS.

(201)249-4239 New Brunswick. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 130Mb) SysOp: David A. Dworkin. Dad's Place. Using OPUS 1.03a 107/339 for quality PD software, echomail confs., Int'l network mail, local message basis, online games/BBSdata.

(201)263-9147 Boonton. Baud: 12/24/19.2, online: 24 hrs/7 days (disk space = 500Mb) SysOp: Jim Sura. Designed Letters BBS. Using PCBoard for IBM/compats. Files compressed w/PKARC. 6 doors to DOS, online RLE Graphics, more. PCPursuitable.

(201)272-2073 Cranford. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 60Mb) SysOp: George Porcella. The Club House. Sponsored by **FOG** A.M.O. 138--JOG Computer Club. Using XT clone & TBBS for US Robotics HST. **FOG member.**

(201)273-0345 Summit. Baud: 12/24, online: 24 hrs (disk space = 40Mb) SysOp: Doug Vohden. The Summit PCBoard. Using PCBoard for IBM/compatibles. Business oriented board featuring 6 doors to DOS,shareware review,conferences.

(201)298-0161 Roselle. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Gary Gorski. JACG BBS with Tom Shoosmith. Sponsored by Jersey Atari Computer Group. For sponsored by the Jersey Atari Computer Group. Open to anyone. Files for both 8 & 16-bit Atari.

(201)373-2125 Newark. Baud: 3/12, online: 24 hrs/7 days SysOp: Bill Rutan. Sorcerer's Palace. Using C-64 for Color Graphics/ASCII.

(201)387-7995 Dumont. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 120Mb) SysOp: Bill Vanglahn. County Jail II. Using Phoenix V1.00 for Interests:IBM and adult.

(201)390-9782 Old Bridge. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Dave Drust. The Hackers Hotline. Using 520ST Michtron 2.1 for mainly Atari, but IBM and Apple SIGs online. Very active message base and many files available.

(201)403-9757 Caldwell. Baud: 12/24, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Glen Johnson. Sportsboard. Using SearchLight for IBM, Commodore. MS-DOS. ANSI graphics on request.12 message boards. DL.

(201)427-8418 New Milford. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: David J. Fischer. Dial-Your-Match #399. Using Zenith Z-159 for computerized dating and meeting system. This is a multi-user (3) system w/ auto switch-over.

(201)463-0315 Somerville. Baud: 3/12/24/96, online: 24 hrs (disk space = 65Mb) SysOp: Paul Papasavas. The Parthenon BBS. For MS-DOS mainly. PC Pursuitable. Woldwide Echomail. Files, online games, color graphics.

(201)471-6391 ??. Baud: 3/12, online: 24 hrs SysOp: Jim Roy. Passaic BBS. Using PC Board for Up/Downloads. 9 conferences and doors. IBM and compatibles.

(201)613-7350 Sayreville. Baud: 12/24/19.2, online: 24 hrs/7 days (disk space = 360Mb) SysOp: Barry Jerkowicz. Jersey Shore BBS. Using PC-Board for 5 conferences, many doors, massive message base, file directories. Quick registration.

(201)633-0569 Wayne. Baud: 300, online: 24 hrs/7 days SysOp: Frank Cahill. Frankly Speaking. Using Diversi-Dial #40 for Multi-User Chat.

(201)654-1680 Westfield. Baud: 300, online: 24 hrs/7 days SysOp: David Modoski. Attic Static. Using Diversi-Dial #41 for Multi-User Chat system.

(201)666-3262 Hillsdale. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Neil Stewart. NJPC User Group. Sponsored by New Jersey PC Users Group. For IBMs, clones / compatibles. 8/N/1.

(201)669-8414 West Orange. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Barry Wasserman. The Univrsity. Sponsored by New Jersey On-Line AutoCAD Users Gp. Using DSoft v6.1 for 24 discussion bases ranging from AutoCAD to gardening D/L for MS-DOS only.

(201)694-6835 Wayne. Baud: 3/12/24, online: 24 hrs SysOp: Ed Gelb. Ed Gelb's Instant BBS. For over 11,000 BBS listings in N. America, Puerto Rico, Virgin Is. and Hawaii $10 w/limited free time.

(201)694-7425 Wayne. Baud: 3/12/24, online: 24 hrs (disk space = 110mb) SysOp: Ed Gelb. Ed Gelb's Data Base. For over 1800 programs for Apple/IBM/Commodore. Message base, membership is free. Since 1980.

(201)727-7514 South Amboy. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 32mb) SysOp: Tom Snyder. Glass Onion BBS. Using EBBS-PC, XTclone for C-64, C-128 and IBM UL/DLs but all are welcome on msg. boards.

(201)743-4850 Bloomfield. Baud: 300, online: 24 hrs/7 days SysOp: Jim Schott. Flash-Talk. Using Diversi-Dial #35 for 7-Line chat system.

(201)753-9758 Central. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 160mb) SysOp: Kevin Tillbrook. ACGNJ BBS. For MS-DOS, CP/M, UNIX, XENIX, C Multiline.

(201)769-1779 Plainfield. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Jeffrey Morgan. Visions Infoline. For media oriented persons.

(201)774-9492 Alsbury Park. Baud: 3/12, online: 24 hrs SysOp: Tom Woodworth. GSCUG. Sponsored by Garden State Commodore User Grp Inc.

(201)787-0449 Port Monmouth. Baud: 3/12, online: 24 hrs SysOp: Daniel Srebnick. IsleNet. Using TBBS multiuser for adult entertainment. Focus with erotic graphics, profiles, and messages.

(201)838-8504 Bloomingdale. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Thomas Thurlby. Tri-boro BBS with Robin Thurlby. Using AT&T 6300 & RBBSPC for Conferences, E-Mail, files, computer help, Up/Download, messages. Dedicated to free info exchange.

(201)868-5233 West New York. Baud: 12/24, online: 24 hrs/7 days (disk space = 120Mb) SysOp: Eran Newman. PC EXPRESS BBS. Using PC Board 14.0 for over 1500 files, farside Asylum, MIDI, Music, Sci-Fi, programming and Buy-Sell section.

(201)895-4452 Randolph. Baud: 3/12/24, online: 24 hrs (disk space = 60mb) SysOp: Matt Yerington. The Executive Lounge. Using Wildcat for active message base, help w/games, investment advice. ANSI color, friendly. Large ul/dl. Free.

(201)922-9607 Neptune. Baud: 3/12, online: 24 hrs SysOp: Jerry *Jerry . . Using GBBS.

(201)941-4793 Elmwood Park. Baud: 3/12, online: 24 hrs (disk space = 640Mb) SysOp: George Lopez-H. Micro-Board. Using Fido-Net for parogramming languages (C, Pascal, ASM, AI). PD Software for IBM PC's, desktop publisher.

(201)942-2576 Wyckoff. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 23Mb) SysOp: Peter Zuroff. FOG #49. Using Osborne & Metal. **FOG member.**

(201)984-5555 Morris Plains. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 80Mb) SysOp: Robert J. Moravsik. Atrium Way with Joseph Chien. Using RBBS 15.1C for PD software exchange. Games. 6 conferences.

(201)988-9489 Neptune. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: Matt Jones. Monmouth Apple BBS. Sponsored by Monmouth Apple Corp. Using GBBS Pro for PD Software, 21 message bases.

(201)998-5945 Kearny. Baud: 3/12, online: 24 hrs SysOp: John Janssen. Station Two BBS. For C 64, C/G, ASC11.

(609)232-1245 Turnersville. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 300Mb) SysOp: Phil Gordemer. Compu-Data. Using PC Board 11 for IBM & MS-DOS compatibles. Three nodes. Database Conf. Info-Mat mag aff. National PCB-Echo mail.

(609)530-0046 Lawrenceville. Baud: 3/12, online: 24 hrs/7 days (disk space = 10Mb) SysOp: Ken Miller. Phoenix RCS System. Using Phoenix RCS for IBM, Commodore and Apple. Validation required.

(609)541-1757 Camden. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: H.John Henry. Publishers Press Serv. For 17 categories of articles(Text files) for Desktop Publishers (download) or Writers (upload).

(609)645-9449 Pomona. Baud: 300-19200, online: 24 hrs/7days SysOp: Dave Schubert. The Casino BBS. Sponsored by South Jersey IBM PC Users Group. For Home of On-line Atlantic City Entertainment Guide and Worldwide 9600 + BPS BBS list.

(609)667-5652 Cherry Hill. Baud: 3/12/24, online: 24 hrs SysOp: Lynn Graves. Liberty Bell BBS. Using PCBoard 12.1/E3 for multinodes, PC/XT/AT support. New BBS user conf. Hearing impaired conf, Doors, QuickMail.

(609)693-9262 Forked River. Baud: 3/12, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Richard Niczypor. The TempeST BBS. Using AtariST Forem-ST for Atari ST and IBM computers.

(609)784-5208 Magnolia. Baud: 3/12/24, online: 24 hrs (disk space = 300Mb) SysOp: Justin Jackson. Microtronics Man Corp. Using PCB 12.1 for lotto network, intimate connection, online store. Four lines auto hunt. MSDOS, Commodore, Atari, Apple.

(609)884-1086 Cape May. Baud: 3/12/24, online: 24 hrs (disk space = 64Mb) SysOp: Mark Montgomery. Wulihan PCBoard BBS. Using PC Board 12.1/D for support of IBMs, Clones and compatibles. 8-N-1.

(609)896-3739 Princeton. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Ron Potash. For For all machines, running T.B.B.S., Apple and MS-DOS PDlibrary.

New Mexico

(505)479-2781 Hollman AFB. Baud: 3/12/24, online: 9pm-6:30am MST SysOp: Ron Surratt. PAC-RAT BBS. Using Michtron BBS 2.10 for Atari ST. Supporting ST/XE/XL.

(505)523-4405 Las Cruces. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Bob Hassel. Tech Con. Using Skyline 1.0 for all Amiga computer. Other computers also welcome. Large Database.

(505)672-1118 Los Alamos. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 80Mb) SysOp: Mark Wallin. Hillltopper BBS. Using ROS-PC for Tourist infor, multiple message & file areas, trivia, games, ROS. Supports MS-DOS, CP/M, Atari, etc.

(505)753-9244 Espanola. Baud: 1224, online: 24 hrs (disk space = 40Mb) SysOp: Tom Gamble. Maranatha Opus. For Christian and technical conf. MS-DOS files.

(505)836-9576 Albuquerque. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 120Mb) SysOp: Terry Stein. Midnight Express PC with Bruce Aldrich. Using PCBoard for debate conf., joke conf., 20doors, star-trek conf., programmers conf.,sysopsconf., DL Directory.

Nevada

(702)386-6613 Las Vegas. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Jim Poston. LVACTS. For downloads text and MSDOS. Info about Las Vegas traffic, signals, traffic counts, road destruction.

(702)438-3625 Las Vegas. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Dennis Makowiski. The Other BBS. Using Amiga500 for Amiga, Commodore, MS-DOS.

(702)459-0450 Las Vegas. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Elton Blair. Clubhouse BBS with Sue Engebritson. Sponsored by Silver State Computer User's Group. Using Wildcat for all computers. No validation. Active message base, U/D and bulletins.

(702)459-8378 Las Vegas. Baud: 1224, online: 24 hrs SysOp: Elton Blair. Project Six BBS with Sue Engebritson. Using Wildcat for Amiga, IBM. No validation. Active message base, U/D, and bulletins.

(702)553-2408 Beatty. Baud: 3/12, online: 24 SysOp: Andy Bernhardt. 2nd Home Elect Cottage. Using DTJ-BBS for all computer users. Running on Commodore 64. General discussion system.

(702)565-8798 Henderson. Baud: 3/12/24, online: 24 hrs (disk space = 64Mb) SysOp: Nick Hard. T.A.C.O. BBS. Using Express for Atari ST, Atari 8 bit, IBM. Instant access-no validation required.

(702)643-8622 Las Vegas. Baud: 3/12/24, online: 24 hrs SysOp: BrookTodd Crenshaw. The NUGET BBS with Larry Wuertzer. Sponsored by Nevada U G for Electronic Telecomm.. For Supporting MS-DOS and TRS-80 downloads and E-Mail. 8.N.1.

New York

(212)431-1194 Manhatten. Baud: 3/12/24/96, online: 24 hrs/7 days SysOp: Mike Sussell. Invention Factory.

(212)489-7370 New York. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 47Mb) SysOp: Liv Hinckley. FOG #15. Sponsored by **FOG** A.M.O. 135--New York Osborne Users' Group. Using Osborne & Metal for high speed callers - USR Courier HST modem now online. **FOG member.**

(212)671-7050 Bronx. Baud: 3/12, online: 24 hrs/7 days SysOp: Bruce Roberts. D'BUG with 'Herbo' Rosenbaum. Sponsored by Bronx-64 Users Group. Using C-64, Vision for Limited message base access is free. Small users fee for non-group members.

(212)751-2347 New York. Baud: 3/12/24, online: 24 hrs SysOp: Dean Peters. ENIAC with Constantine Peters. Sponsored by International Elect. Musician's U.G. For info about MIDI, music, electronic instruments, computers.

(212)879-9031 New York. Baud: 3/12, online: 24 hrs SysOp: Robert Sweeney. The Big Electric Cat with Charles Foreman. For woldwide USENET/UUCP network access, online multichat. games.

(315)245-0510 Camden. Baud: 3/12, online: 6pm-6am M-F,24h Wk (disk space = 21Mb) SysOp: Lance Williams. Kadet PCBoard. Using PCBoard 10.0 for D/U for IBM/MS-DOS, astronomy, sysops, soft/hardware review. Message database for all computers.

(315)392-2368 Old Forge. Baud: 3/12, online: 24 hrs/7 days SysOp: Joseph Nelson. The WAY, TRUTH, LIFE. Using Apple for Spiritual and theological themes. Bible research ,question and answer. Daily one-min.-meditation.

(315)422-4078 Syracuse. Baud: 3/12, online: 7pm-8am M-F/24 Wkd SysOp: John Bigness. JBS Information Servic. For specializing in advertising used computers, peripherals, and software. Messages. Penpals. Free.

(315)471-2970 Syracuse. Baud: 3/12/24, online: 24 hrs SysOp: Patrick Gleason. Midnight Auto Parts. For 10 line chat. Features Dial-Your-Match #479 computer dating. phone order computer parts buy/sell.

(315)472-1058 Syracuse. Baud: 3/12/24, online: 24 hrs (disk space = 10Mb) SysOp: Phil Shatz. The Show Partner BBS. For technical support. Sponsored by Brighbill-Roberts & Co, Technical Support Dept.

(516)361-9665 Smithstown. Baud: 3/112/24, online: 24 hrs SysOp: Tak Li. . For diskdump. Download service. Long Island (Free). IBM & Compatible.

(516)483-3975 Garden City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 160Mb) SysOp: Jeffrey Matthews. Unicorn BBS with Andy Appel. For IBM-PC and compatibles. 8/N/1. U/D. Small annual fee.

(516)486-4705 South Hempstead. Baud: 3/12/24, online: 24 hrs/7 days SysOp: David Johnson. The Unknown RBBS. Using AT&T for AT&T PC6300 help, compatibles welcome. Home/originator: – UNIX Portal – . Tech ref, games, confs., UNIX.

(516)736-6662 Selden. Baud: 3/12, online: 24 hrs/7 days (disk space = 20Mb) SysOp: John Woodstock. Your Software Resource. Using Atari 520ST for PC, Atari (8/16), Commodore computers. Confs. include Sysop, Amateur Radio, Games, PC, Atari, C'dore. **PRACSA member.**

(516)822-7396 Plainview. Baud: 3/12/24, online: 6pm-6am M-F 24 Wkd SysOp: Russell Frey. . Using PC Board for lots of doors, message bases. Part of PCB-Relax Network. Everyone welcome. Can subscribe for $15/yr.

(516)928-4986 Coram. Baud: 12/24/19,2, online: 24 hrs/7 days (disk space = 100Mb) SysOp: Gene DeLibero. The East Coast MidiBBs. Using Leading Edge for Atari ST, IBM/Compatibles, Apple/Mac, Commodore, Amiga. Dedicated to Music professionals. DL.

(516)938-6722 Hicksville. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 460Mb) SysOp: Jim Toro. P.D.S.L.O. Database. Using TBBS for massive PD software. C.B. Sim chatting, online mag & news, user-run SIGS. 5 lines. Fee required.

(518)235-6228 Troy. Baud: 3/12, online: 6 pm to 6 am EST SysOp: David Dugrenier. COMPUFACTS. For technical documents & schematics machine specific utility & diagnostic programs.

(518)273-8313 Troy. Baud: 3/12, online: 24 hrs SysOp: Clint Anglin. The Androma Galaxy. For MS-DOS software exchange, E-

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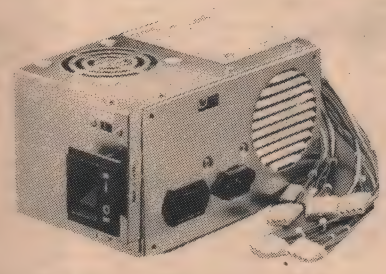

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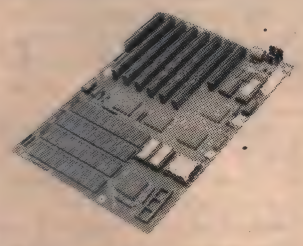

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(518)383-4282 Clifton Park. Baud: 3/12/24, online: 24 hrs (disk space = 80Mb) SysOp: Norm Sellers. Capital of New York. For IBM. Color graphics, message bases, file transfers, online games.

(518)783-6409 Schenectady. Baud: 3/12/24, online: 10pm to 8 am (disk space = 32Mb) SysOp: Joe Chamberlin. Escapeware. Using 8/N/1 for IBM and compatilbe, some color computer programs. Classifieds, e-mail, contests.

(518)793-9574 Glens Falls. Baud: 3/12/24, online: 24 hrs (disk space = 30Mb) SysOp: Ross Calloway. The HOST BBS. Using TPBoard v4.0 for 8/N/1 Special purpose - catering to the handicapped and Disabled computerist. FidoNet 1:13/41.

(607)732-4565 Elmira. Baud: 3/12/24, online: 24 hrs (disk space = 108Mb) SysOp: Robert Jeffries. PC-ROOF BBS. For multi message bases, SIGS, forums, polls, online games,database, E-Mail. AT Clone for all comp.

(716)254-2385 Rochester. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: John Passaniti. PassPort Public BBS. Using FCBBS for alternative lifestyles, atheism conference. Controversial discussion, no files.

(716)433-8108 Lockport. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Gail Allore. The Trail BBS. Sponsored by Shak Pak. Using Coco 2 for Email, want-ads, storyboard, on-line games, database. Supports Apple, Atari, Coco, Commodore, IBM.

(716)442-8144 Rochester. Baud: 3/12/24, online: 24 hrs SysOp: Phillip Dampier. Flower City Newsline. For all news & Info with USA Today Decisionline, Infomat. Controversial discussion, no files.

(716)458-2638 Rochester. Baud: 3/12/24/96, online: 24 hrs SysOp: Tom Bellucco. The Atari Apex. Sponsored by Atari Computer Owners of Rochester. For Atari ST, 8-bit. FOREM.

(716)458-6547 Rochester. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Gary Stelmok. WATS-A-MOK BBS. Using 1-Supra Puff BBS for 7 message bases, U/D, PD programs. No fee.

(716)461-1168 Rochester. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Phillip Dampier. Flower City Fileline. For file transfers for Commodore 64/128 and MS-DOS.

(716)482-2622 Rochester. Baud: 3/12, online: 24 hrs/7 days SysOp: Gene Christiano. The Dealer Nearest You. Using Apple IIe for all computers.

(718)252-0534 Brooklyn. Baud: 12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Lefty Tsintzelis. Crazy Fox BBS. Using RBBS-PC 16.1A for IBM & compatibles, lots of conferences available.

(718)351-3859 Staten Island. Baud: 3/12, online: 24 hrs/7 days SysOp: Anneliese Sessa. Ariel BBS. Using C-64 Frog BBS for help for all computers, Daytime CHAT.

(718)373-0623 Brooklym. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Jim Harmon. After Hous Online. For Atari ST, Macintosh, MS-DOS. Sponsored by After Hours Computer and Software Training.

(718)380-5750 Briarwood. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Jerry Salem. Seven Ray Institute. For Esoteric Astrology, Esoteric Psychology. **FOG member.**

(718)392-8836 Queens. Baud: 12/24/96, online: 24 hrs/7 days (disk space = 300Mb) SysOp: Tom Vera. Thunder Road BBS. Using IBM PCBoard 12.1 for Qwikmail, relaymail, active SIGS. Member of PCB relay. Twin 9600 US Robotis HST modems.

(718)482-0089 Queens. Baud: 3/12/24, online: 24 hrs SysOp: Greg Trobaugh. Apple Cider/Computer. For multi-user BBS.

(718)891-8100 Brooklyn. Baud: 3/12, online: 24 hrs (disk space = 1 Gb) SysOp: Jonathan Gleich. Earth/News ENetwork. Using Galacticomm for multi-user system with 13 lines. Small fee.

(914)235-4957 Westchester. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: Scott Edger. The Stand BBS. Using PCBoard ProNet for U/D, PCBrelay National message echo. Conferences online. MS-DOS files.

(914)271-9366 Croton on Hudson. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: M. Gllynn. Croton BBS. Using PCBoard for 6/1 D/U ratio required. No fee. Apple II User's conf supporting Binary packed ProDos Basic Files.

(914)667-4567 Westchester. Baud: 12/24, online: 24 hrs/7 days (disk space = 500Mb) SysOp: Andy Keeves. Executive Network BBS. Using PCBoard mulit-node for callers interested in networking. Running five nodes on autohunt. 8/N/1. New user reg. only.

(914)667-4684 Harrison. Baud: 12/24/96, online: 24 hrs (disk space = 500Mb) SysOp: Craig Kaminer. Executive Network. Using AT, Novell, USRobot for QwikMail, PCB-Echo. discussion groups. Multi-line. 30 main directories.

(914)667-4759 Harrison. Baud: 12/24/96, online: 24 hrs (disk space = 500Mb) SysOp: Craig Kaminer. Executive Network. Using PCBoard multi-node for QuikMail, PCB-Echo. 30 Main directories. All nodes available to members. 2 nodes available to public.

(914)858-8722 Port Jervis. Baud: 3/12, online: 24 hrs (disk space = 10Mb) SysOp: Richard VanHouten. West End BBS. Using TBBS for CoCo, Tandy portables, Commodore 8-bit, IBM and compatibles, Atari 8-bit, Ti-99/4A, TI Prof, Apple.

Ohio

(216)576-9481 Jefferson. Baud: 3/12, online: 6pm-9am M-F,24 Wnd (disk space = 32Mb) SysOp: Vern Hall. Nightwing BBS. For 8/N/1 using IBM PC/MS-DOS.

(216)671-6922 Cleveland. Baud: 3/12, online: 10pm to 6am EST SysOp: Robert Parish. Timelines....BBS with Kathy Parish. For Sinclair/Timex systems. Serving QL,Spectrum,ZX-81, TS-2068, TS-1500, TS-1000, computers.

(216)784-0574 Akron. Baud: 3/12, online: 24 hrs/7 days SysOp: Bob Piatt. Stairway to Heaven. For Atari 8 bit, ST, Amiga. 26 on line games.

(216)896-9500 Greensburg. Baud: 3/12, online: 24 hrs/7 days (disk space = 30Mb) SysOp: Nancy Abbott. Data Base BBS. Using IBM PC, Collie for all computers. Run by the Comp. Tech. students at Portage Lakes Joint Vocational School.

(216)943-2388 Willoughby. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 15Mb) SysOp: Ray Furlong. Cleveland Syslink with Michael Sura. Sponsored by Northern Ohio Business Users Group. Using Syslink for general discussion. 8/N/1. Monthly meetings, For sale, – Info Files – , – Tonkin Articles – .

(513)233-9500 Huber Heights. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Smitty Smith. ACE Information Servic. Sponsored by Miami Valley Atari Comp Enthusiasts.

(513)259-0806 Fairborn. Baud: 3/12/24, online: 24 hrs SysOp: Rich Walsh. DMUG BBS. Sponsored by Dayton MSDos Users Group. Using Opus for info about group. Helping MS-DOS Users increase productivity through software and hardware exch.

(513)293-1754 Dayton. Baud: 3/12/24, online: 24 hrs/7 days SysOp: Terry Morrow. DMA RBBS. Sponsored by Dayton Microcomputer Assoc, Inc. For use by current/prospective group members.

(513)436-3434 Dayton. Baud: 12/24 MNP5, online: 24 hrs/7 days (disk space = 65Mb) SysOp: Mark Cottom. The Shermark BBS with Steve Swope. Using OPUS, Fido 110/30 for MS-DOS files, online games. Wide variety natn'l/local echomail. Immediate access.

(513)446-3108 Georgetown. Baud: 3/12/24, online: 6pm-6am M-F,24 Wkd (disk space = 32 Mb) SysOp: Clinton LaRue. Barn Owl. Using OPUS for IBM and compatibles, Commodore, CP/M. File tansfers, messages, online games.

(513)522-3076 Cincinnati. Baud: 3/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Mark Klein. Interstellar TBBS. For MSDOS,TRS-80, Apple, Commodore,and CoCo Software.

(513)787-3777 Camden. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: James Redd. The Imagination BBS. For Atari 8-bit & ST, C-64 & Amiga, IBM, Apple, CP/M and others. Uploads/downloads.

(513)877-2537 Cincinnatti. Baud: 3/12, online: 24 hrs SysOp: Dave Wesenberg. Master Software/Cnsltg. For UNIX, IBMPC, Tandy, Apple, Church, Job/Resume Listings, up/downloads, messaging, conferences.

(614)335-3972 Washington. Baud: 3/12/24, online: 24 hrs (disk space = 65Mb) SysOp: Bob West. Washington Court House with Mark Gwynn. Using PCBoard for MS/PCDOS. Online games, bulletins, 20file areas. U/D.

(614)423-7879 Belpre. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: ted Miller. DEC-BBS. Using Wildcat for IBM, Atari, CP/M, Kaypro, Commodore, Timex/2068. DL on first call.

(614)439-0310 Cambridge. Baud: 3/12, online: 24 hrs/7 days (disk space = 70Mb) SysOp: Vester Scott. SE OH Comp Society BBS. Sponsored by SE Ohio Computer Society. For all personal computers.

(614)439-7451 Cambridge. Baud: 3/12/24, online: 24 hrs (disk space = 82Mb) SysOp: Vester Scott. The Other Board. Using Unix for Professional, personal, civic, hobby, entertainment, online programs. Desktop pub, graphics.

(614)471-8559 Gahanna. Baud: 3/12, online: 24 hrs/7 days (disk space = 1.3Mb) SysOp: Frank Seipel. A.C.E.C. BBS. Using Atari A.M.I.S. for primarily Atari 8-bit, but anyone welcome.

(614)676-7742 Bellaire. Baud: 300, online: 24 hrs/7 days SysOp: Tony Pacifico. Spaghetti Land BBS with Bob Randolph. Using C-Net 12.0 for C-64 and C-128, all computers welcome. Online games. Empire. Say you saw the ad and rec. special acc.

(614)855-1024 Columbus. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: Tom Martin. Electric Chronicle. Sponsored by Amiga Users Group of Columbus Ohio. Using IBM AT RBBS-PC for Amiga support and MS-DOS.

(614)895-5604 Columbus. Baud: 3/12/24, online: 24 hrs (disk space = 80Mb) SysOp: Jon Glazer. The Micro Gallery. Using Wilcat for IBM-PC/XT/AT software, retail pricings for computer equipment. Large file & message base.

Oklahoma

(405)249-7143 Vance AFB. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Carol Miller. 71FTW/SC-SCTS BBS. Sponsored by Northwest MS-DOS User Group. Using Sperry PC400 for technical support, E-Mail,MS/PC-DOS up/down, shareware, freeware for OBM PC and compatibles.

(405)329-6464 Oklahoma City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 70Mb) SysOp: Whitney Boutin. Constitutional Pathway. Sponsored by **FOG** A.M.O. 67--OKlahoma City Personal Computers. Using Osborne & Metal for FOG Remote System #13. **FOG member.**

(405)376-1494 Mustang. Baud: 300, online: 24 hrs/7 days SysOp: Thomas Mangham. CoCoNet. Sponsored by Central OK Computer Organization. For Radio Shack CoCo. Programs/mail available. 7-N-1.

(405)447-2152 Altus. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Herb Sayre. My Place BBS. Using Wildcat for MS-DOS only. Ansi graphics. Batch DL with Z&Y-modem protocols.

(405)477-2152 Altus. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Herb Sayre. My Place BBS. Using Wildcat for batch D/L with Z & Y-modem protocols. Files for MS-DOS only. Ansi8 graphics.

(405)482-5624 Altus. Baud: 3/12/24, online: 24 hrs (disk space = 20Mb) SysOp: Dudley Roach. Dudley's Software Exch. Using Wildcat for MS-DOS U/D. Message area. Run on Tandy 1000TX.

(405)598-3482 Tecumseh. Baud: 3/12, online: 24 hrs (disk space = 30Mb) SysOp: Greg Trotter. TARDIS VI. Using Opus for technical discussions, online games.

(405)631-9040 Oklahoma City. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 107Mb) SysOp: David Grothe. Amiga Line BBS. Sponsored by Oklahima Amiga Computer Enthusiasts. For THE source of Amiga information in Oklahoma.

(405)672-8270 Oklahoma City. Baud: 3/12, online: 24 hrs/7 days SysOp: Jerry Robertson. Sooner 99'ers BBS. Sponsored by Sooner 99'ers. For TI 99/4A and Geneve computers.

(405)736-6676 Midwest City. Baud: 3/12/24, online: 24 hrs SysOp: John Fordenbacher. MidWest MIDI BBS. Sponsored by International Elect. Musician's U.G. For info about MIDI, music, electronic instruments and computers.

(918)455-5544 Broken Arrow. Baud: 3/12/24, online: 24 hrs (disk space = 110Mb) SysOp: Michael Meyer. Data Warp PCBoard. Using PCBoard for ProDoor and Relay Message Door.

(918)585-9437 Tulsa. Baud: 3/12, online: 24 hrs (disk space = 15 Mb) SysOp: Ken Wyatt. The Tulsa Phantom. Sponsored by Green Country Computer Association. Using TBBS for strong political & religious discussions, confidental – line noise – advice from a LMSW. Tandy.

(918)835-4072 Tulsa. Baud: 3/12/24, online: 24 hrs (disk space = 50Mb) SysOp: Terry Garrett. E/tech BBS with Rick Brumbaugh. Using Fidonet for CD-Rom with PC-SIG 15,000 + programs disk running on a 386 machine. Full color.

(918)836-6336 Tulsa. Baud: 3/12, online: 24 hrs (disk space = 120Mb) SysOp: Mike Lester. G.C.C.A. Motherboard. Sponsored by Green Country Computer Association. Using DESQview Galaxy for MS-DOS, Tandy, Laptops, Atari. Membership required for full access.

Oregon

(503)234-4967 Portland. Baud: 3/12, online: 24 hrs (disk space = 20Mb) SysOp: Jeff Murphy. Mother Murphy's BBS. Using Opus for users of Warnier/Orr systems methodology. Interest to genealogists, educators, LDS, children.

(503)276-7807 Pendleton. Baud: 3/12, online: 24 hrs/7days (disk space = 20Mb) SysOp: David Chamberlain. Megastar Public BBS. Using PCB 12.1/A for technical conf, computer conf, doors, online games. IBM and compatible. file transfers.

(503)582-4860 Rogue River. Baud: 3/12/24/96, online: 24 hrs (disk space = 60Mb) SysOp: Steve Lea. System Three R's. Using FidoNet for IBM, Atari, Commodore, Amiga download, messages, online games, EchoMail.

(503)667-2242 Portland. Baud: 3/12, online: 24 hrs (disk space = 40Mb) SysOp: Wayne Winterbottom. Q-Meg BBS. Using Carina II for Atari 8/ST, IBM/Compatible, Amiga, Commodre, Macintosh. Email, Fmail, online games. PC Pursuitable.

(503)688-2056 Eugene. Baud: 3/12, online: 24 hrs/7 days SysOp: Bill Robbins. BillBoard. Sponsored by DC-BUG.

(503)775-7590 Portland. Baud: 3/12/24, online: 24 hrs SysOp: Phil Patrick. NWSE Opus. Sponsored by Northwest Sanyo Enthusiasts. Using Opus.

Pennsylvania

(215)252-8867 Easton. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Michael E. Mattes. Tekkie BBS. Using WWIV for supporting IBM and Clones. Technical section. DL.

(215)296-0558 Malvern. Baud: 3/12/24/96, online: 24 hrs SysOp: Frank Gomez. DNA Networks BBS. For complete info on DNA Nerworks, including DL technical manual.

(215)332-2834 Phila. Baud: 3/12/24, online: 24 hrs (disk space = 32Mb) SysOp: Mario Kirincich. Fish'N Chips Christian. Using Wildcat for instant access, U/D, no fee. Programs for all computers, message base, all faiths welcome.

(215)363-6625 Exton. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Peter Rucci. Delches. Using TComm.

(215)463-4173 Philadelphia. Baud: 3/12, online: 24 hrs/7 days (disk space = 49Mb) SysOp: Mike Myers. Using Opus for Supports PC's & Macintosh. Validation required before Full Access. Fidonet Echomail.

(215)464-3562 Philadelphia. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 100Mb) SysOp: Mark Miller. Satronics TBBS. For ex-

perimental Online Virtual Community. 5 lines, SIGs for MS-DOS and Macintosh. No fees.
(215)536-5571 Quakertown. Baud: 3/12, online: 24 hrs/7 days (disk space = 21Mb) SysOp: Christopher Betz. InterLink I & C Serv.. Using IBM XT for relaxed atmosphere where questions and answers are many. DL area.
(215)547-7009 Levittown. Baud: 3/12/24, online: 24 hrs (disk space = 30Mb) SysOp: Daryl Marietta. LUGBBS. Sponsored by LowerBucks User Group. For MS-DOS, Amiga, Mac, Commodore, CP/M. File transferes, online database & newsletter.
(215)559-1941 Easton. Baud: M/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Dawn Brader. The Limited Edition. Using Phoenix for software for IBM and Clones. DL. Intelligent discussions, adult section. An all female operated BBS.
(215)763-7766 Philadelphia. Baud: 3/12, online: 24hrs (disk space = 10Mb) SysOp: Steve Stecklow. Philadelphia EpsonNet. For Epson computer owners, including QX, PX and Equities.
(412)231-4055 Pittsburgh. Baud: 3/12/24, online: 24 hrs (disk space = 60Mb) SysOp: Marcel Schmelzer. Mtn View Elect Micro. Using TBBS 2.0 for message bases, U/D, online games, special interest groups.
(412)276-1269 Pittsburgh. Baud: 1200, online: 24 hrs/7 days SysOp: Chuck Fricaro. UCS-2. For Concurrent down/upload using the Multi-Com(tm) file transfer system.
(412)362-2277 Pittsburgh. Baud: 3/12/24, online: 24 hrs SysOp: Eric Haver. Cascade BBS. Using Fido Opus for Utilites, dBase, C, International Fidomail, Echoes, File REQuests, CrashMail.
(412)431-8649 Pittsburgh. Baud: 3/12, online: 24 hrs (disk space = 40mb) SysOp: Anthony Kapolka. Electric Eclectic UNIX. Using AT&T 3b1 for role-playing gaming, topics in Computer Science, up/downloads, UUCP netmail, newsgroups. 431-UNIX.
(412)486-4133 Pittsburgh. Baud: 3/12, online: 24 hrs/7 days (disk space = 65Mb) SysOp: R. Gierl. PACE BBS. Sponsored by Pittsburgh Atari Computer Enthusiasts. For Supports all Atari computers.
(412)751-6625 Elizabeth. Baud: 3/12/24, online: 24 hrs (disk space = 80Mb) SysOp: Richard Parker. Main Interface Core. Using MIBBS 1.02 for multiple message bases, public domain files. Geared towards small businesses and services.
(412)771-5763 McKees Rocks. Baud: 3/12/24, online: 7pm to midnight (disk space = 40Mb) SysOp: Kris Celedonia. QX-tension RCP/M. Sponsored by **FOG** A.M.O. 50--Three Rivers Osborne Group. Using Epson QX-10 & QBBS for CP/M and local users groups. No restrictions. **FOG member.**
(717)387-1937 Bloomsburg. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Ed Jr. Sabo. UBI BBS with Janet Dove. Using Atari ST for all computers. Online games. Large message base.
(717)394-1357 Lancaster. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 620Mb) SysOp: Jerry Shenk. Lancaster Area BB. For Multi-User, C Programming, Bible Message Base, CP/M Message Base, mainframe users group.
(717)429-1529 Pottsville. Baud: 3/12/24/96, online: 24 hrs/7 days SysOp: D. Scott Joy. St. Clair BBS Systems. Using Wildcat! for all MS-DOS, many live programs online, no verification needed. Support for Tandy Models 3 & 4.
(717)429-2724 Pottsville. Baud: 3/12/24/96, online: 10 pm-8 am/7days SysOp: Scott Joy. St. Clair RBBS. Using RBBS 16.1A for all MS-DOS. Many doors, tradewars 1000. No verifcation needed.
(717)560-1750 Lancaster. Baud: 3/12/24, online: 24 hrs (disk space = 40Mb) SysOp: Mike Dissinger. The Tusk BBS. Using Ansi for Amiga, IBM, Tandy, Apple,C64-C128, Atari.Message boards, voting booth. 8N1.
(717)657-8699 Harrisburg. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 75Mb) SysOp: George Peace. The Other BBS. Using Osborne & Metal for CPM+ software. **FOG member.**
(717)790-7925 ??. Baud: 3/12/24, online: 24 hrs. (disk space = 30 mb) SysOp: David Hultberg. NAVSEALOGCEN RBBS. Using RBBS-PC v16.1A for Subboards for IBM and compatibles and the TI 99/4A. New subboards are added as usage requires.
(717)938-5568 York. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 40Mb) SysOp: Craig Beible. Micro-Link][. Using PCBoard for support for all DOS systems. Online games, ASCII, G/I/X/YModems. confs and more.
(814)339-6042 Lemont. Baud: 3/12/24/96, online: 24 hrs SysOp: Greg Granville. NEUG Lifesaver BBS. Sponsored by National Epson Users Group. For telecommunication requests for sample newletters. Need x-modem or CRC x-modem for downloading.

Rhode Island

(401)732-2169 Warwick. Baud: 3/12/24, online: 24 hrs (disk space = 30Mb) SysOp: Justin Langseth. ALPHAnet #1. Using ALPHAnet for many message bases, CB simulator.

South Carolina

(803)256-3546 Columbia. Baud: 3/12/24/96, online: 24 hrs/7 days (disk space = 20Mb) SysOp: Shay Walters. Para-Soft BBS. For PC/MS-DOS, CP/M and Ham Radio.
(803)293-4930 Myrtle Beach. Baud: 3/12/24, online: 24 hrs. (disk space = 32 mb) SysOp: George Lewis. Wolves den BBs. Using EBBS PC for For Amiga and C64/128. Very active message bases and Xfer sections.
(803)366-6235 Rock Hill. Baud: 3/12/24, online: 24 hrs/7 days (disk space = 60Mb) SysOp: John Threatt. Critical Mass BBS. Using Amiga, BBS-PC for Commodore, Amiga files, messages and E-mail.
(803)895-3536 Tigerville. Baud: 3/12/24, online: 24 hrs (disk space = 80Mb) SysOp: Matt Cooley. The Ultimate BBS. Using RBBS for all computers, online games, conferences, students invited.

Tennessee

(615)353-3472 Nashville. Baud: 3/12/24, online: 24 hrs SysOp: Paul Clawser. NSTI BBS. Using Fido for share ware, MSG's. Sponsored by Nashville State Technical Institute- Electronics Dept.
(615)353-3476 Nashville. Baud: 3/12/24, online: 24 hrs SysOp: Kenneth Snively. EET BBS. For Electronics, share ware, school info, notices, BBS listings. Spronsored by Nashville St Tech Inst.

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Milwaukee Magazine, June 1987.

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WHAT YOU COULD HAVE
Would you like public domain and shareware word processor programs, communications programs, or excellent database management systems? How about personal money managers, or General Ledger programs? If that is not enough, look at the 2000 games and 11,000 free business oriented programs, utilities, tutorials, and reviews. This gives you everything from hard disk reorganization and backup to stock market management systems. We also maintain the *entire PC-SIG collection* online, the 1000+ diskette collection of public domain software from California.

WHO HAS IT?
Exec-PC owns and operates the nation's largest electronic Bulletin Board System. Through our BBS, our huge software collection is available to anyone who has access to a modem and a telephone line. We have more than 50,000 individual files available for immediate download to your computer, 24 hours a day, every day.

WHAT IT IS
The BBS consists of a large computer with BIG disk drives (more than 1 gigabyte!) and many phone lines connected to it. The computer currently has 60 phone lines, allowing it to talk to 60 callers at once; it receives about 2000 calls per day. Using the BBS is easy, since it is menu driven and you simply choose what you want to do.

WE SURE HAVE FILES
A typical user will call the BBS, ask the BBS to show what files are new since his or her last call, find files of interest, then transmit those files across the phone line. After hanging up, the caller can examine and use the new software.

WE SURE DO TALK
Our BBS also has an active conference system where hundreds of people share ideas and solutions. Some conferences include: PC General Topics, Communications, For Sale, Programming, Desktop Publishing, LAN, Graphics, Hardware Speedup, PCjr, CAD/CAM, Private e-mail, etc. Why pay expensive consultants when there are hundreds of experts available in our forums and conferences?

HOW DO I ACCESS THE SYSTEM?
The Exec-PC BBS is available through either direct dial-up, or through a new service called Telenet PC Pursuit. Long distance callers enjoy PC Pursuit because it allows unlimited long distance calling for $25 per month. The PC Pursuit service is offered by GTE/Telenet. Contact them at 1-800-835-3638. Ask us about our Telenet Direct Connect!

HOW TO CALL THE EXEC-PC BBS
1. Set your asynchronous modem for any speed up to 2400 baud. (Call for 9600 baud info.)
2. Start up your communications program.
3. Dial 414-964-5160.
4. The BBS will ask for your name, then you will be guided into the menus.

IT IS FREE, BUT
You can call the BBS at any time without registering. You can tour the system, read messages, and download some of our files. For greater access privileges you may register at the following rates: $15 for 3 months or $45 for one year. You may subscribe online with VISA or MC, or by credit card, check or money order with the form below.

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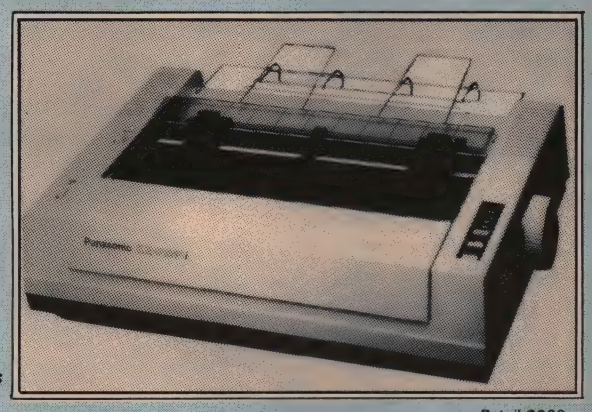

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Users Groups

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FOG (P. O. Box 3474, Daly City, CA, 94015, data: 415-755-8315) is THE International Nonprofit Computer Users Group and is devoted to the enhancement of the computer experience. Membership in **FOG** is $25 per year and includes a subscription to one of the **FOG** publications and much more. If you are interested in more information about **FOG**, **send a large SASE** to the address above.

This listing is provided by **FOG** members for the computer community. Regardless of what other groups a user belongs to, a local group can provide valuable assistance in learning more about your computer. Use this listing to find the groups of value to you.

How To Use This Listing

Each group is listed only once, either under a state and area code (or country) or as a Special Interest Group (not limited to a geographic area). Information supplied by a group officer determines how the group is listed. All listings are in state, area code, and city sequence. Foreign countries and SIGs are listed last.

In the event that you live near a state border, be sure to check the listings for BOTH states when searching for a group. For example, residents of the Washington, DC area should check **DC 202**, **MD 301**, and **VA 703**. Many users should also check the last page of these listings for the SIGs.

Submission Policy

All user group entries must be submitted in **writing** by the first of every month. **Submissions received by the first of April (at FOG** office) the will appear in the July issue. The listing will be good for three issues. **If an update report is not received** every three months, the listing will be deleted. Once their group is on the list, some groups just add **FOG** to their mailing list. Please remember that we can only scan most newsletters so be sure to highlight any changes. Group officers are responsible for promptly forwarding accurate information to:

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Daly City, CA 94015-0474

For faster handling, please reference the number assigned to each group.

We are not responsible for errors published in these listings.

Urgent Notice:

All phone number shown in this listing of user groups are VOICE numbers. Some are daytime fones, some evening fones but in all cases, common sense should be used when calling these numbers. Don't call after 9pm or before 9am LOCAL TIME. Remember, one day you may be the contact for the group!

United States

AK 907

FOG A.M.O. 63--Ankor-Guide Computer Group (Ankor-Guide), P. O. Box 210089, Anchorage, AK 99521-0089. 907-278-3138 Supporting CP/M, MS-DOS.

1066-Amiga User's Group in Alaska (AUGA), c/o Wolfgang Kurtz, P. O. Box 211511, Anchorage, AK 99521-1511. 907-561-6661 Supporting Amiga.

1286-Alaska Computer Society (ACS), 6401 Downey Finch, Anchorage, AK 99516. 907-345-0542 Supporting MS-DOS.

202-True Basic Interest Group, c/o E.L.Evans, P.O.Box 020309, Juneau, AK 99802-0309.

FOG A.M.O. 83--Baranof Users' Group (BUG), c/o Irene Shuler, Box 438, Sitka, AK 99835. 907-747-8615 Supporting CP/M.

AL 205

1058-Birmingham IBM PC User Group, P. O. Box 19248, Birmingham, AL 35219. Supporting MS-DOS.

FOG A.M.O. 49--First Alabama O U G (FAOUG), c/o Ed Burquez, 303 North Hwy 47, Columbiana, AL 35051. 205-669-5200 Supporting CP/M, MS-DOS.

1107-TI-BUGS, 1338 Edwards St., Dolomite, AL 35061. Supporting TI99/4A.

1110-Wiregrass 99er U.G., 102 Auburn Dr, Enterprise, AL 36330. Supporting TI99/4A.

FOG A.M.O. 125--Huntsville Computer Club (HCC), c/o John Heaman, 8705 Valley View Drive S.E., Huntsville, AL 35802. 205-881-0377 Supporting CP/M, MS-DOS.

904-North Alabama TI-99/4A Computer Cl, P.O. Box 11204, Huntsville, AL 35804. Supporting TI99/4A.

1285-Micro Computer Database User Group, 804 Jordan Lane, Huntsville, AL 35816. 205-895-9187 Supporting database.

98-South Alabama Apple Users Group (SAPPLE), P. O. Box 91336, Mobile, AL 36691-1336. 205-661-0931 Supporting Apple, Macintosh.

140-South, Mobile & Alabama Users Grou (SMAUG/99), c/o Pete Smith, 2006 Riverside Drive, Mobile, 36605 36426. 205-867-7193 Supporting TI99/4A.

1108-Shoals 99'ers, P.O. Box 2928, Muscle Shoals, AL 35662. Supporting TI99/4A.

1109-TIBUG Birmingham, c/o Allan Cox, 728 Jefferson Blvd, Tarrant, AL 35217. 205-839-5592 Supporting TI99/4A.

AR 501

FOG A.M.O. 23--Arkansas/Oklahoma PC Users Group (Ark/OkPCUG), c/o Data-Tronics Corp., Box 853, Fort Smith, AR 72902-0853. 501-785-8600 Supporting CP/M, MS-DOS.

308-Hot Springs Multi-Users Group, c/o Computerworks, P. O. Box 1193, Hot Springs, AR 71902. Supporting all systems.

1113-Jacksonville TI U.G., P.O. Box 91, Jacksonville, AR 72076. Supporting TI99/4A.

309-Little Rock CP/M-MS/DOS Tech User (LRTUG), c/o Elmer A. Wingfield, 26 Belmont Drive, Little Rock, AR 72204. 501-565-3798 Supporting CP/M, MS-DOS.

1289-UAMS dBase Special Interest Group, c/o Univ. of Arkansas for Medical, 4301 West Markham St, SLOT 620, Little Rock, AR 72205. 501-661-5507 Supporting dBase.

1202-Rogers PC Users Group, 2258 No. 2 St, Rogers, AR 72756-2439. 501-636-8935 Supporting MS-DOS.

827-Northwest Ark Microcomputer User G (NWA-MCUG), c/o Bill Shook, Rt 4 Box 376, Springdale, AR 72764. 501-361-2963 Supporting MS-DOS.

914-Jonesboro User Group (JUG), c/o Larry Heyl, P.O. Box 838, State University, AR 72467. 501-932-6979 Supporting all systems.

147-Helena-WestHelena Micro-Computer U, P. O. Box 2184, West Helena, AR 72390. 501-572-5503 Supporting all systems.

AZ 602

143-Douglas Computer User's Group, P. O. Box 544, Douglas, AZ 85608. 602-364-9604 Supporting all systems.

FOG A.M.O. 100--Tempe Osborne Group (TOG), c/o Sergent, Hauskins & Beckwith, 3232 West Virginia, Phoenix, AZ 85009. 602-947-7646 Supporting CP/M, MS-DOS.

7-Valley One Twenty Eight Club (VOTE), P.O. Box 21063, Phoenix, AZ 85036. 602-345-9919 Supporting Commodore.

1055-Amiga Arizona user group (AmAz!), c/o Stan Krawczyk, P. O. Box 82371, Phoenix, AZ 85071-2371. 602-938-9736 Supporting Amiga.

1288-Phoenix Paradox Special Interest G, c/o Jim Michels, 1340 W. Mulberry Dr, Phoenix, AZ 85013. 602-274-2461 Supporting Paradox.

1296-Phoenix Heath Users Group (PHUG), Phoenix, AZ. 602-254-9083 Supporting Heath Zenith.

40-Prescott Area Commodore Club (PACC), P.O. Box 4019, Prescott, AZ 86302. 602-778-7893 Supporting Commodore, Amiga, MS-DOS.

1287-Phoenix dBase Users Group, c/o Dorothy Liebich, P.O. Box 5411, Scottsdale, AZ 85261. 602-951-2556 Supporting dBase, database.

1074-Vista IBM PC Users Group, c/o John Sebens, 821 N. Buckhorn Drive, Sierra Vista, AZ 85635. 602-458-2068 Supporting MS-DOS.

222-Arizona Macintosh Users Group (AMUG), P.O. Box 28120, Tempe, AZ 85282. 602-926-2080 Supporting Macintosh.

311-Arizona Commodore Users Group (ACUG), c/o Dave Thornton, P. O. Box 27201, Tempe, AZ 85282. 602-839-4557 Supporting Commodore.

1093-Arizona Amiga Users Group (AAUG), P.O. Box 907, Tempe, AZ 85281. 602-967-4054 Supporting Commodore, Amiga.

42-Tucson Osborne Network (TON), c/o Donald P. Randolph, 9328 North Gazelle Place, Tucson, AZ 85741-9525. 602-744-3693 Supporting Osborne.

1159-Southwest Ninety-niners U.G., c/o Wesley Eng, P.O. Box 17831, Tucson, AZ 85738. 602-747-5046 Supporting TI99/4A.

CA 209

FOG A.M.O. 35--Fresno Computer FOG Club (FCFC), c/o Realestate Center, 1759 Fulton Street, Fresno, CA 93721. 209-442-4544 Supporting all systems.

117-Fresno Clipper User Group, 1283 West Keats Ave, Fresno, CA 93711. 209-227-1600 Supporting Clipper.

FOG A.M.O. 66--South Valley FOG (SVFOG), c/o Olson Computer Services, 1502 North Lowery Street, Porterville, CA 93257. 209-781-4123 Supporting CP/M, MS-DOS.

114-Stockton Commodore 64 Users Group (C-64), c/o Jack & Rita McCann, 2929 Calariva Drive, Stockton, CA 95204. 209-477-8565 Supporting CP/M, Commodore.

1180-Multitechs Users of Stockton, 7212 Kelley Drive, Stockton, CA 95207.

CA 213

216-Area 99er's Users Group, 16328 Placid Dr, Whittier, CA 90604. 213-943-6631 Supporting TI99/4A.

701-LA 99er Computer Group, c/o Teresa Masters, P.O. Box 3547, Gardena, CA 90247. 213-271-6930 Supporting TI99/4A.

51-Amiga User's Group of Long Beach (AUGLB), c/o Larry Blair, 5115 Via Veranada, Long Beach, CA 90805. 213-422-8226 Supporting Amiga.

84-Long Beach Business Users Group (LBUGS), c/o Kassay Accounting Service, 3227 Ladoga Avenue, Long Beach, CA 90808. 213-595-6341 Supporting Business, MS-DOS.

1092-Kenny's Long Beach Users Group, c/o Kenneth Fonseca, 1133 Locust St, Long Beach, CA 90813. 213-436-3601 Supporting MS-DOS, Commodore, Apple.

88-Los Angeles Clipper User Group, 10573 West Pico, Ste 151, Los Angeles, CA 90064. 213-839-3459 Supporting Clipper.

155-Los Angeles Amiga Users Group (LAAUG), P. O. Box 947, Los Angeles, CA 90026. 213-387-3698 Supporting Amiga.

488-Southwest PC Users Group, c/o Christine Tripp, P. O. Box 78785, Los Angeles, CA 90016. 213-935-4105 Supporting MS-DOS.

437-Greater South Bay PC Users Group, P. O. Box 1937, Redondo Beach, CA 90278. 213-532-2123 Supporting MS-DOS.

CA 408

1075-AT&T Computer Users Group (S. Bay), c/o Joe Lipsig. 408-733-6522 Supporting AT&T, MS-DOS, WGS, Unix.

315-Byte Bandits of America, c/o R. W. Brown, 780 Manx Avenue, Campbell, CA 95008. 408-379-2774 Supporting Tandy TRS-80.

313-Timex Sinclair Silicon Valley (GUTS/SV), c/o Bill Miller, 6675 Clifford Dr, Cupertino, CA 95014-4530. 408-253-3175 Supporting Timex Sinclair.

377-Novell Users Group-Silicon Valley (NUG-SV), P. O. Box 360872, Milpitas, CA 95035-0872. 408-263-0213 Supporting Novell, MS-DOS, networks.

FOG A.M.O. 5--Monterey Bay Area O U G (MBAOUG), c/o Ken Roberts, 30 Linda Vista Drive, Monterey, CA 93940. 408-372-9266 Supporting CP/M, MS-DOS.

1170-The Plus/4 Users' Group (PLUG), P.O. Box 1001, Monterey, CA 93942. Supporting Commodore Plus/4 C-16.

435-Piconet Microcomputer Users Group (Piconet), P. O. Box 391566, Mountain View, CA 94039. 408-374-8090 Supporting CP/M, MS-DOS.

833-Bay Area Atari Users Group (BAAUG), P. O. Box 50459, Palo Alto, CA 94303. 408-241-0585 Supporting Atari.

1191-PC Unix SIG, c/o David C Harris, Box 1257, Palo Alto, CA 94302. 408-432-1300 Supporting Unix.

1241-APL, Bay Area Users' Group, Palo Alto, CA. 408-292-4060 Supporting APL.

1097-S100 Club, c/o K J Griffin, P.O. Box 2935, San Francisco, CA 94126. Supporting S-100, CP/M.

FOG A.M.O. 1--First FOG of Silicon Valley (1st FOG SV), c/o Seth Emerson, 3462 Kirkwood Drive, San Jose, CA 95117. 408-371-8699 Supporting CP/M, MS-DOS.

1177-Bay Area AT&T P.C. User Group, 224 Airport Pkwy, San Jose, CA 95110. 408-733-6522 Supporting MS-DOS, AT&T.

1242-Apple Blossom Users Group, San Jose, CA. 408-281-0222 Supporting Apple.

1253-South Bay WordPerfect User Group, c/o Martin vander Pool, 3178 Tully Road, San Jose, CA 95148. 408-238-8434 Supporting WordPerfect, MS-DOS.

1259-Silicon Valley DEC PC User Group, c/o Gary Catalano, San Jose, CA. 408-275-1133 Supporting DEC Rainbow, MS-DOS, CP/M.

1266-San Jose IBM PC-Club, c/o Harry Benton, San Jose, CA. 408-281-5178 Supporting MS-DOS (IBM employees only).

1272-Bay Area Convergent Technology U.G (BACTUG), c/o Bill Knoff, San Jose, CA. 408-265-2600 Supporting ConvTech.

1277-S-100 BUS User Group, c/o Dick Verna, San Jose, CA. 408-262-2679 Supporting S-100.

439-Silicon Valley Computer Society (SVCS), c/o Kent Safford, 2464 El Camino Real Suite #190, Santa Clara, CA 95051. 408-286-2969 Supporting MS-DOS.

1176-Augment Amiga Users Group, 1572 Los Padres Blvd. Ste. 209, Santa Clara, CA 95050. 415-651-1160 Supporting Amiga.

FOG A.M.O. 116--Microcomputer Users of Santa Cruz (MUSC), c/o Rosemary Faitos, 105

Weeks Avenue, Santa Cruz, CA 95060. 408-476-0504 Supporting CP/M, MS-DOS.
5-TPRO Users Group (TPRO), Santa Cruz, CA. Supporting Turbo C.
908-E.S.C.A.P.E., Santa Cruz, CA. 408-335-4384 Supporting Atari.
1205-Scotts Valley Amiga Users Group (SVAUG), c/o F. Turner, 108 Calvin Place, Santa Cruz, CA 95060. 408-438-5001 Supporting Amiga.
1249-AutoCAD User Group of Santa Cruz, Santa Cruz, CA. 408-462-0448 Supporting AutoCAD, MS-DOS.
1256-MIDICruz Computer & Music Users, c/o Robert, Santa Cruz, CA. 408-476-8464 Supporting MIDI.
1267-Santa Cruz Computer Society, c/o Daniel Payne, Santa Cruz, CA. 408-476-0203 Supporting MS-DOS.
218-Eagle Computer Users Group (ECUG), P.O. Box 3381, Saratoga, CA 95070. 408-972-1965 Supporting CP/M, MS-DOS, Eagle.
1239-Salinas-Monterey Amiga User Group (SMAUG), Seaside, CA. 408-678-2518 Supporting Amiga.
1222-ACTRIX Computer Enthusiast Society, Sunnyvale, CA. 408-756-5104 Supporting Actrix.
1234-AMIGA Science & Tech. Users Group (ASCITEC), Sunnyvale, CA. 408-756-4940 Supporting Amiga.
1251-Bay Area System Interfacing Societ (B.A.S.I.S.), c/o Clay Walker, Sunnyvale, CA. 408-736-7704
1258-BayVAX Local Users Group (BayVAX LUG), Sunnyvale, CA. 408-734-9511 Supporting DEC VAX.
1269-Christian Macintosh User Group, c/o Rick Thrasher, Sunnyvale, CA. 408-437-1913 Supporting Macintosh.

CA 415

15-California Genealogical Society (CGS), c/o Bill. 415-235-6107 Supporting Geneology.
499-Forth Interest Group Silicon Valle (FIG/SV), c/o George Shaw. 415-276-5933 Supporting Forth.
1112-V-P Planner Users Group, c/o Lloyd Bracewell. 415-547-8205 Supporting V-P Planner, MS-DOS.
50-The IBM & Compatibles Users Group (ICUG), 30 Arjang Ct, Alamo, CA 94507-2041. 415-964-2977 Supporting MS-DOS, CP/M.
93-Bay Area Kaypro Users & Programmer (BAKUP), P. O. Box 8537, Berkeley, CA 94707. 415-527-7272 Supporting Kaypro, MS-DOS, CP/M.
126-BMUG (BMUG), 1442A Walnut Street Suite 62, Berkeley, CA 94709. 415-849-9114 Supporting Macintosh.
1161-BAYTALK Computer Users Group, P.O. Box 369, Berkeley, CA 94701. Supporting visually & physically impaired.
1178-Berkeley PC Users Group, c/o Melvin Mann, 1145 Walnut St, Berkeley, CA 94707. 415-526-4033 Supporting MS-DOS.
1231-S.F. Alpha Micro Users (SF/AMUS), c/o Bob Fowler, 1304 Acton St, Berkeley, CA 94706-2502. 415-527-7631 Supporting Alpha Micro.
1233-Amiga East Bay User Group (AEBUG), Berkeley, CA. 415-845-4814 Supporting Amiga.
1243-Apple East Bay Users, Berkeley, CA. 415-845-4814 Supporting Apple.
1260-Bay Area Desktop Publishing U. G., c/o Dr. C.J. Wallia, Berkeley, CA. 415-848-8200 Supporting Desktop Publishing, MS-DOS.
148-San Francisco Alpha Micro Users So (SF/AMUS), c/o Bob Fowler, 1304 Acton St, Berkelley, CA 94706-2502. 415-527-7631 Supporting Alpha Micro.
73-Diablo Valley Commodore Users Grou (DVCUG), P. O. Box 27155, Concord, CA 94527. 415-686-4049 Supporting Commodore.
1163-RBBS-PC Users Group, 4396 N. Prairie Willow Ct., Concord, CA 94521. Supporting telecommunications, remote systems.
1244-Diablo Valley Apple Users, Concord, CA. 415-672-7596 Supporting Apple.
1281-Diablo Valley Atari Comp Enthusias (D.A.C.E.), Concord, CA. 415-757-0173 Supporting Atari.
1162-Bay Area Tandy Users, 567 Black Hawk Club Dr, Danville, CA 94526. 415-934-8975 Supporting Tandy.
1236-Amiga Addicts Anonymous (AAA), Diablo Valley, CA. 415-689-3453 Supporting Amiga.
21-Diablo Valley PC Users Group, c/o Evelyn Warren, 700 Alhambra Road, El Sobrante, CA 94803. 415-222-0908 Supporting MS-DOS.
1184-SPC Apple, 4542 Bartolo Terrace, Fremont, CA 94536. Supporting Apple.
1246-Soc Prevention of Cruelty to Apple (SPCApple), Fremont, CA. 415-537-3439 Supporting Apple.
136-San Mateo Ventura Publisher Users, 280 Medio Ave, Half Moon Bay, CA 94019. Supporting Ventura.
1262-Ventura Desktop Publishing User Gr, c/o Eleanor Church, 280 Medio Avenue, Half Moon Bay, CA 94019. 415-726-3181 Supporting Ventura Desktop Publishing, MS-DOS.
316-TRS Nybblers, c/o Dr.M. Edwards, Chabot College, 25555 Hesperian Blvd, Hayward, CA 94545. 415-846-3575 Supporting MS-DOS, CP/M.
321-San Francisco TI 99ers, c/o Gary L. Anderson, 24816 Mango Street, Hayward, CA 94545. 415-786-1776 Supporting TI99/4A.
1255-Hayward CompuPro User Group, Hayward, CA. 415-886-2980 Supporting CompuPro.
888-Livermore Atari Computer Club, Livermore, CA. 415-447-1241 Supporting Atari.
1015-Access, Livermore Commodore Us Grp, Livermore, CA. 415-449-1784 Supporting Commodore.
1235-Amiga Users of Marin (AUM), Marin, CA. 415-924-5384 Supporting Amiga.
1283-Marin Commodore Computer Club, Marin, CA. 415-579-0426 Supporting Commodore.
FOG A.M.O. 68--San Mateo Osborne Group (SMOG3), c/o Philip A. Moore, 1331 Crane Street, Menlo Park, CA 94025. 415-325-2442 Supporting CP/M.
444-Apple /// Users of No. Calif, 220 Redwood Hwy #184, Mill Valley, CA 94901. 415-538-0203 Supporting Apple///.
FOG A.M.O. 31--Marin Osborne Group (MOG), P. O. Box 1726, Novato, CA 94948. 415-897-0629 Supporting CP/M, MS-DOS.
1275-No. Cal. 3Com Users Group, c/o Greg Bulette, 100 Galley Drive, Novato, CA 94949. 415-883-8100 Supporting 3Com, networks, MS-DOS.
FOG A.M.O. 3--East Bay FOG (EBFOG), c/o Patricia Watters, 5497 Taft Avenue, Oakland, CA 94618. 415-272-9099 Supporting CP/M, MS-DOS.
594-Bay Area NEC/100 User's Group, c/o Truly Portable, P. O. Box 2916, Oakland, CA 94609. 415-658-1889 Supporting NEC 8201A, Tandy 100.
1237-Amiga Users Oakland, Oakland, CA. 415-652-4746 Supporting Amiga.
1250-East Bay AutoCAD Users Group, c/o Gene Katz, Oakland, CA. 415-832-2153 Supporting AutoCAD, MS-DOS.
1257-FLEXibles, c/o Howard Klein, Oakland, CA. 415-836-1642 Supporting Dataflex, database.
1264-East Bay User Group, Oakland, CA. 415-436-2453 Supporting MS-DOS.
1088-Stanford Mac Users Group (SMUG), Palo Alto, CA. 415-723-7684 Supporting Macintosh.
1265-Mid-Peninsula IBM PC-Club, c/o Scott Maiden, 1501 California Ave, Palo Alto, CA 94304. 415-855-4509 Supporting MS-DOS (IBM employees only).
1268-Peninsula Lisa Users, c/o Lois Guice, Palo Alto, CA. 415-454-7607 Supporting Apple Lisa.
1276-Nota Bene User Group, c/o Thomas Ross, Palo Alto, CA. 415-845-2410 Supporting Nota Bene, MS-DOS.
764-Amiga East Bay Information Exchang (AEBIE), c/o Arthur, P. O. Box 485, Pinole, CA 94564. 415-233-2476 Supporting Amiga.
320-CLUB 100: Model 100 Users Group (CLUB 100), c/o Richard Hanson, P. O. Box 23438, Pleasant Hill, CA 94523. 415-932-8856 Supporting Tandy TRS 100/102/200.
1247-Tri Valley Apple II User Group, Pleasanton, CA. 415-829-3672 Supporting Apple.
1271-Tri-Valley Macintosh User Group (TMUG), c/o Mike, Pleasanton, CA. 415-838-6165 Supporting Macintosh.
1240-San Francisco Commodore Users, Ralston, CA. 415-832-1539 Supporting Amiga.
1263-Bay Area Heath Users Group (BAHUG), c/o Ed Hayes, Redwood City, CA. 415-326-4486 Supporting Heath Zenith.
318-San Mateo TRS-80 Users Group (SMUG), 2691 Cottonwood Drive, San Bruno, CA 94066. 415-992-1783 Supporting Tandy TRS-80.
1282-Commodore Owners Workshop (C.O.W.), San Bruno, CA. Supporting Commodore.
48-Peninsula Kaypro Users Group (KAYFUN), c/o Larry Welling, 222 Laurel St., #310, San Carlos, CA 94070. 415-593-9981 Supporting Kaypro, MS-DOS, CP/M.
63-Data Processing Management Assoc (DPMA), San Carlos, CA. 415-591-5736 Supporting MS-DOS.
319-First Amiga Users Group (1st AUG), 543 Old Country Road, San Carlos, CA 94070. 415-595-5452 Supporting Amiga.
FOG A.M.O. 2--San Francisco Computer Society (SFCS), P. O. Box 783, San Francisco, CA 94101-0783. 415-929-0252 Supporting CP/M, MS-DOS.
35-Epson Users of San Francisco (EUSF), c/o Ted McCalla, 534 Boardway #220, San Francisco, CA 94133. 415-681-5382 Supporting Epson, CP/M, Valdocs.
52-CWest, Bay Area Commodore Users (CWEST), P.O. Box 146731, San Francisco, CA 94114. 415-282-7143 Supporting Commodore, Amiga.
123-San Francisco Bay Area Clipper SIG, c/o Avelino Associates, 2081 Hayes St, San Francisco, CA 94117. 415-751-2719 Supporting Clipper.
153-IBM AT/XT Clone User Group, P. O. Box 15000/324, San Francisco, CA 94115. 415-861-9321 Supporting MS-DOS.
605-Computer Alliance/Media Alliance, c/o Media Alliance, Ft. Mason Bldg E, Room 205, San Francisco, CA 94123. 415-771-7133
671-AT&T Computer Users Group (AT&T CUG), P.O. Box 410321, San Francisco, CA 94141-0321. 415-586-8376 Supporting MS-DOS, WGS, AT&T.
924-Atari Bay Area Comp.Users Society (ABACUS), P.O. Box 22212, San Francisco, CA 94122. 415-753-8483 Supporting Atari.
1101-San Francisco PC Users Group (SF PC UG), 3145 Geary Blvd, Ste 155, San Francisco, CA 94118-3316. 415-751-5219 Supporting MS-DOS.
1164-San Francisco PC Jr Users Group, c/o John King, Box 20, 2336 Market Street, San Francisco, CA 94114. 415-472-7035 Supporting PCjr MS-DOS.
1165-Assoc. for Systems Management, San Francisco, CA. 415-434-4141 Supporting MS-DOS.
1182-Northern California Pick Users (NCPU), P.O. Box 884474, San Francisco, CA 94188-4474. 415-284-4063 Supporting Pick.
1229-Bay Region Adam Information Networ (BRAIN), San Francisco, CA. 415-282-3056 Supporting Adam.
1230-AI-Expert Systems for Businesses (ESB), San Francisco, CA. 415-564-6669 Supporting Artifical Intelligence.
1232-Amiga Desktop Video User Group (ADV), San Francisco, CA. 415-334-2071 Supporting Amiga.
1245-San Francisco Apple Core, San Francisco, CA. 415-771-5830 Supporting Apple.
1252-Bay Area Basis 108 Users Group (BAYBUG), c/o Roger Bernhardt, San Francisco, CA. 415-221-0262 Supporting Basis 108.
1261-PC Publishers of Northern Calif., San Francisco, CA. 415-661-9270 Supporting Desktop Publishing, MS-DOS.
1273-Computer Associates UG of N. CA, c/o Beth Markus, San Francisco, CA. 415-864-6770 Supporting SuperCalc.
1274-Gay/Lesbian PC User Group, San Francisco, CA. 415-334-9761 Supporting MS-DOS.
1284-Silicon Valley Commodore Comp Club (SVCCC), San Jose, CA. 415-942-1679 Supporting Commodore.
158-San Leandro Apple Eaters Users Grp, c/o Bob Shayler, 2200 Bancroft Ave., San Leandro, CA 94577. 415-483-6046 Supporting Apple.
196-San Leandro Apple Eaters User Grou, c/o Bob Shayler, San Leandro HS, 2200 Bancroft Ave, San Leandro, CA 94577. 415-483-6046 Supporting Apple.
1183-San Leandro Computer Club, P.O. Box 1525, San Leandro, CA 94577. 415-325-8118 Supporting Atari.
1278-The Unix C-Club, San Mateo, CA. 415-348-6723 Supporting Unix, 'C'.
629-Marin Sonoma PC Users Group (MSPCUG), P.O. Box 6476, San Rafael, CA 94903. 415-491-4295 Supporting MS-DOS.
1270-Macs of Marin (MOM), c/o Steve Salzman, San Rafael, CA. 415-459-5707 Supporting Macintosh.
79-Stanford Palo Alto User Group (SPAUG), c/o Louise Bolitho, P. O. Box 3738, Stanford, CA 94309. 415-322-3850 Supporting MS-DOS.
1238-Bay Area Amiga Developers Group (BADGE), Stanford, CA. 415-723-1646 Supporting Amiga.
162-South County PC Users Group (SCPCUG), c/o Bob McCloud, P.O. Box 499, Union City, CA 94587. 415-537-9899 Supporting MS-DOS.
FOG A.M.O. 60--Mt. Diablo Osborne Group (MTDOG), c/o Larry's Booknook, 730 - A Bancroft Road, Walnut Creek, CA 94598. 415-933-2665 Supporting CP/M.
1168-California Original Atari ST Us Gp (COAST), Walnut Creek, CA. 415-945-1949 Supporting Atari.
1199-Diablo Valley PC Users Group, P.O. Box 8040-117, Walnut Creek, CA 94596. 415-943-1367 Supporting MS-DOS.

CA 619

38-North County 99'er Users Group, P.O. Box 2500, Escondido, CA 92025. 619-748-1967 Supporting TI99/4A.
1171-UCSD PaScal Users Society (USUS), P.O. Box 111148, La Jolla, CA 92038. Supporting UCSD Pascal.
775-LA MAC, c/o Dick or John Mac, 5515 Jackson Drive #3, La Mesa, CA 92042. 619-226-5732 Supporting Macintosh.
FOG A.M.O. 130--San Diego Osborne Users (SDOU), c/o Worswick Industries, 4898 Ronson Court, San Diego, CA 92111. 619-299-5769 Supporting CP/M, MS-DOS.
32-San Diego Computer Society (SDCS), P. O. Box 81444, San Diego, CA 92138. 619-284-5196 Supporting all systems.
FOG A.M.O. 114--High Desert Osborne Group (HOG), c/o Johnson - McClure Computing, 71845-A 29 Palms Hwy, Twentynine Palms, CA 92277. 619-367-2440 Supporting CP/M, MS-DOS.
1291-The High Desert Public Domain U.G., Victorville, CA. Supporting MS-DOS.

CA 707

812-IBM Humboldt Users Group (HUG), P. O. 6721, Eureka, CA 95502. 707-442-4621 Supporting MS-DOS.
FOG A.M.O. 6--Microcomputer U G of Solano & Yolo (MUGSY), c/o Ron Forsythe, P. O. Box 1011, Fairfield, CA 94533. 707-446-6643 Supporting CP/M, MS-DOS.
FOG A.M.O. 29--Humboldt Osborne Group (HOG), c/o R C Electronics, P. O. Box 2751, McKinleyville, CA 95521. 707-445-2074 Supporting CP/M, MS-DOS.
FOG A.M.O. 56--North Bay FOG (NBFOG), c/o Mrs. E C (Teddy) O'Malley, 3274 Holland Drive, Santa Rosa, CA 95404. 707-546-1797 Supporting CP/M, MS-DOS.
647-Santa Rosa Commodore Users Group, P. O. Box 5830, Santa Rosa, CA 95402-5830. 707-584-7009 Supporting Commodore.
695-Solano Community PC Club (SCPCC), c/o Solano Community College, 4000 Suisun Valley Road, Suisun City, CA 94585-0246. 707-422-1131 Supporting MS-DOS.
157-Vallejo Amiga People (VAMP), c/o Willard H. Braun, 111 Bayview Ave, Vallejo, CA 94590. 707-554-0263 Supporting Amiga.

CA 714

723-Amstrad PCWUSERS SIG, c/o Al Warsh, 2751 Reche Canyon Rd #93, Colton, CA 92324. 714-370-0359 Supporting Amstrad PCW.
1201-Saddleback Valley Users Group, c/o Mike McCasline, P.O. Box 2752, Costa Mesa, CA 92628. Supporting TI99/4A.
FOG A.M.O. 113--North Orange County C C Osborne SI (NOCOSIG), c/o Scott Cosel, 9091 Holder Street, #128, Cypress, CA 90630-5855. 714-952-5627 Supporting CP/M, MS-DOS.
1014-Users Group of Orange County (UGOC), 17301 Santa Isabel Street, Fountain Valley, CA 92708. 714-546-8354 Supporting TI99/4A.
99-San Diego Clipper User Group, 17671 Van Buren St, Apt A, Huntington Beach, CA 92647. 714-843-9886 Supporting Clipper.
228-South Orange commodore Klub (SOCK),

Users Groups

c/o Don Gribble, 25401 Champlain Rd, Laguna Hills, CA 92653. 714-830-2430 Supporting Commodore, Amiga.

53-North Orange County Computer Club (NOCCC), P. O. Box 3616, Orange, CA 93665. Supporting all systems.

1085-Assoc. for Sharing Commodore Info (ASCI), 8395 Ninth St, Rancho Cucamongo, CA 91730. 714-989-6041 Supporting Commodore.

589-T I Riverside User Group (TI-RUG), c/o Ed Butcher, 7125 Deleware Street, Riverside, CA 92504. 714-686-0336 Supporting TI99/4A, Geneve 9640.

113-Orange County Clipper User Group, P.O. Box 26529, Santa Ana, CA 92799-6529. 714-847-7123 Supporting Clipper.

CA 805

648-Kern Independent PC User Group (KIPUG), P. O. Box 2780, Bakersfield, CA 93303. 805-327-1866 Supporting MS-DOS.

760-Bakersfield Area Commodore Users S (ABACUS), P. O. Box 40334, Bakersfield, CA 93384. 805-871-8245 Supporting Commodore, Amiga.

FOG A.M.O. 47--Central Coast Osborne Group (CCOG), c/o Melvin Johnson, 1836 10th Street, Los Osos, CA 93402. 805-528-2382 Supporting CP/M.

163-Slo Bytes IBM PC User's Group (SloBytes), c/o Bob Ward, 2100 Andre Ave, Los Osos, CA 93402. 805-528-0121 Supporting MS-DOS.

965-Ventura County PC Users Group (VCPCUG), c/o Bob Mell, P.O. Box 1134, Oak View, CA 93022. 805-649-1138 Supporting MS-DOS.

FOG A.M.O. 69--Osborne Santa Barbara Users Group (OSBUG), c/o Jarry Bartz, 650 Aurora Avenue, Santa Barbara, CA 93109. 805-965-4343 Supporting CP/M, MS-DOS.

FOG A.M.O. 42--Central Coast Computer Club (Four Seas), c/o Fred Fields, 1634 North De Joy Court, Santa Maria, CA 93454. 805-925-3456 Supporting CP/M, MS-DOS.

CA 818

991-San Gabriel Valley Tandy Users Grp (SAGATUG). 714-592-4178 Supporting Tandy.

613-Valley Computer Club, c/o Aaron Epstein, P. O. Box 6545, Burbank, CA 91510-6545. 818-769-1837 Supporting all systems.

323-San Fernando Valley 99ers (SFV 99ers), 2823 Sanborn Avenue, La Crescenta, CA 91214. 818-248-9558 Supporting TI99/4A.

676-Valley TRS-80 Users Group (VTUG), P.O. Box 7113, Mission Hills, CA 91346. 818-664-5059 Supporting TRS-80.

FOG A.M.O. 106--Technical & User Groups Network (TUG-NET), 12125 Riverside Drive #205, North Hollywood, CA 91607. 818-894-7835 Supporting CP/M, MS-DOS.

928-Valley TRS 80 Hackers Group (VTHG), P. O. Box 9747, North Hollywood, CA 91609. 818-982-0467 Supporting Tandy 1, 3, 4/4P/4D, LoboMax.

FOG A.M.O. 86--Osborne National Users Group (ONUG), c/o Alicia Fahey, P. O. Box 424, Northridge, CA 91328. 818-709-6202 Supporting CP/M, MS-DOS.

FOG A.M.O. 84--Osborne Komputer Owners Klub (OKOK), P. O. Box 40429, Pasadena, CA 91104-7429. 818-794-3243 Supporting CP/M, MS-DOS.

324-Pasadena IBM Users Group (PIBMUG), 711 East Walnut Street #306, Pasadena, CA 91101. 818-795-2300 Supporting MS-DOS.

483-Pasadena Commodore Computer Club (PCCC), P.O.Box 40667, Pasadena, CA 91004. 818-798-2534 Supporting Commodore.

326-San Gabriel Valley TRS-80 Users Gr (SAGATUG), c/o John Phillip, 815 South Walnut Avenue, San Dimas, CA 91733. 714-592-4178 Supporting Tandy TRS-80.

1195-San Fernando Valley Epson QX Users (SFVEQXUG), 5150 Calvin Ave, Tarzana, CA 91356. 818-881-4029 Supporting Epson, CP/M, TPM, Valdocs, MS-DOS.

773-San Fernando Valley Amiga Users Gr (SFVAUG), P.O.Box 8183, Van Nuys, CA 91409. 818-719-9211 Supporting Amiga.

927-Valley IBM/Compatibles Users Group (VICUG), c/o Harry Tischler, 7560 Woodman Place # E8, Van Nuys, CA 91405. 818-997-6000 Supporting MS-DOS.

CA 916

1103-Gold Country KUG, 25129 Table Meadow Road, Auburn, CA 95603. 916-268-2362 Supporting all systems.

956-Northern California Amiga Club (NCAC), c/o David L. Murphy, P. O. Box 54, Bella Vista, CA 96008. 916-472-3237 Supporting Amiga.

159-Sacramento PC Users Group, P.O. Box 685, Citrus Heights, CA 95611-0685. 916-332-1944 Supporting MS-DOS.

830-Redding Atari Computer Enthusiasts (R.A.C.E.), P.O. Box 818 1553 Main St, Cottonwood, CA 96022. 916-243-5189 Supporting Atari.

152-Davis PC Users Group, P. O. Box 2249, Davis, CA 95617-2249. 916-756-6838 Supporting MS-DOS.

145-Sacramento Clipper User Group, 9409 Emerald Vista Dr, Elk Grove, CA 95624. 916-685-7940 Supporting Clipper.

1095-Sacramento 99'ers, c/o John Riley, 7661 Plaid Cir., North Highlands, CA 95660. Supporting TI99/4A.

FOG A.M.O. 61--Sacramento Osborne Group (SOG), P. O. Box 660787, Sacramento, CA 95866-0787. 916-482-8804 Supporting CP/M, MS-DOS.

72-Sacramento Commodore Computer Club (SCCC), P. O. Box 133393, Sacramento, CA 95813-3393. 916-483-3558 Supporting Commodore.

1045-Sacramento Microcomputer User's Gr (SMUG), P. O. Box 161513, Sacramento, CA 95816. Supporting CP/M, MS-DOS, Unix, 68K.

1293-Alpha-Omega Telecommunications Grp, c/o Tim Ryan, 1604 Stewart Rd, Sacramento, CA 95864. Supporting Telecommunications.

CO 303

1017-Metro Area Computer Enthusiasts (MACE), P.O. Box 440247, Aurora, CO 80044. 303-680-1751 Supporting MS-DOS.

687-CP/M SIG Inc, P. O. Box 633, Broomfield, CO 80020-0633. 303-494-8068 Supporting CP/M, MS-DOS.

161-Colorado Revelation Users Group (CORUG), c/o Tyler Band, 419 So Vine St, Denver, CO 80209. 303-733-3347 Supporting Revelation.

167-Denver Rainbow Users Group (DRUG), c/o Steve Montague, 6251 S. Leyden St, Englewood, CO 80111. 303-770-5325 Supporting DEC Rainbow.

FOG A.M.O. 115--Fort Collins Osborne Group (FTCOG), c/o Tom Noonan, 209 East Swallow, Fort Collins, CO 80525. 303-226-4156 Supporting CP/M.

1186-Front Range PC Users Group (FRPCUG), 305 W. Magnolia #152, Fort Collins, CO 80521. 303-223-8654 Supporting MS-DOS, CP/M, Unix, Zenix.

FOG A.M.O. 4--DOG Computer Club (DOG), c/o D. M. Cochran Geologic Consult, 8745 West 14th, #216, Lakewood, CO 80215. 303-421-6486 Supporting CP/M.

1280-Rock Mountain 99ers, c/o Mark Payne, 1825 East 113th Avenue, Northglen, CO 80233. 303-452-3077 Supporting TI99/4A.

CO 719

FOG A.M.O. 133--Colorado Springs Osborne Group (CSOG), c/o James R. Sheldon, 2412 Sturgis Road, Colorado Springs, CO 80909. 719-473-7647 Supporting CP/M, MS-DOS.

221-Pikes Peek Poke Atari Comp Enth (P3ACE), P.O. Box 9282, Colorado Springs, CO 80935. 719-596-1130 Supporting Atari.

328-Front Range 99'er Computer Club, P. O. Box 9572, Colorado Springs, CO 80932. 719-976-3199 Supporting TI99/4A.

926-Colorado Springs PC Users Group (COSUG), c/o George C. Wing, P. O. Box 1028, Colorado Springs, CO 80901. 719-635-4716 Supporting MS-DOS.

700-Pueblo Atari ST Enthusiasts (PASTE), c/o Bill Renkel Jr., 3186 South Osceola, Denver, CO 80236. Supporting Atari.

458-The MicroUser Group, 6651 Metropolitan St., Security, CO 80911.

CT 203

440-Nutmeg TI-99ers, c/o Janet Ryan, 10 Jolly Road, Ellington, CT 06029. 203-875-1647 Supporting TI99/4A.

67-Connecticut Osborne Group, c/o Stephen T. Whitney, R.F.D. #2, Box 1659, Meredith, NH 03253. 203-655-7998 Supporting Osborne.

822-CT IBM Personal Computer User's Gr (CPC), c/o John McGinley, P. O. Box 291, New Canaan, CT 06840. 203-762-0229 Supporting MS-DOS.

971-Central Conn. PC (PCjr) Group, c/o Ted Melinosky, 525 Foster Street, South Windsor, CT 06074-2936. 203-644-2358 Supporting PCjr, MS-DOS.

1175-ST ATari Users Society (ST.AT.U.S.), 869 Sullivan Ave, South Windsor, CT 06074. 203-644-3435 Supporting AtariST, Atari.

1299-Trumbull PC User's Group (TPCUG), P.O. Box 545, Trumbull, CT 06611. 203-334-4267 Supporting MS-DOS.

FOG A.M.O. 40--Western CT Microcomputer Users' Gr (WC/MUG), c/o 48 Winston Drive, P.O. Box 186, Washington Depot, CT 06794-0186. 203-775-1102 Supporting CP/M, MS-DOS.

FOG A.M.O. 54--Yankee Osborne Users Group (YOU), c/o Daryl Gehlbach, 222 Griswold Drive, West Hartford, CT 06119. 203-523-0345 Supporting CP/M, MS-DOS.

171-Connecticut Computer Society (CCS), P.O.Box 17-032, West Hartford, CT 06117. 203-233-4141 Supporting all systems.

DC 202

1027-NorthStar User's Group (N*UG), c/o Burt Andrews. 202-299-3469 Supporting NorthStar.

1172-Capital Area SysOp Association (CASA). Supporting telecommunications, remote systems.

984-National Capital Amiga Users Group (NCAUG), P. O. Box 12360, Arlington, VA 22209. 301-231-3517 Supporting Amiga.

920-Capital Area Timex/SinclairUsersGr (C.A.T.S.), c/o Vernon Smith, P.O. Box 467, Fairfax Station, VA 22039. 703-978-1835 Supporting Timex Sinclair.

220-Capital PC Users Group, 51 Monroe Street, Plaza East Two, Rockville, MD 20850. 301-762-6775 Supporting MS-DOS.

1119-Metro PC jr Users Group, c/o Dave Tursan, 9203 Antelope Place, Springfield, VA 22153. 301-949-6500 Supporting PCjr, MS-DOS.

DE 302

209-Delmarva Apple Users Group (DAUG), c/o Barbara A Chaffinch, RD 2 Box 94-A, Bridgeville, DE 19933. 302-337-8009 Supporting Apple.

211-Delmarva Apple Users Group-Dover C, c/o Jim Dorigatti, 1065E 3 Ave, Dover, DE 19901. 302-736-0679 Supporting Apple.

1215-PC Professional Users Group, P.O. Box 2350, Wilmington, DE. Supporting MS-DOS.

FL 305

813-South Florida Computer Group (SFCG), c/o Joe Ruby, P. O. Box 5684, Ft. Lauderdale, FL 33310-5684. 305-972-6676 Supporting all systems.

759-Miami Amateur Computer Club (MACC), c/o Heath/Zenith, 4705 West 16th Avenue, Hialeah, FL 33012. 305-823-2280 Supporting MS-DOS, CP/M, Heath Zenith.

332-Miami PC User Group Inc (MPCUG), c/o Jeffrey Feinberg, 4651 Sheridan St., Ste 300, Hollywood, FL 33021. 305-962-8889 Supporting MS-DOS.

FOG A.M.O. 26--Gold Coast Computer Group (GCCG), P. O. Box 661256, Miami, FL 33266-1256. 305-258-4334 Supporting CP/M, MS-DOS.

129-Miami Individuals w/Commodore Equi (MICE), 11110 Bird Road, Miami, FL 33165. 305-221-7115 Supporting Commodore.

754-North Dade Computer Society, c/o Roy Renderer, 1710 NE Miami Gardens Drive, Miami, FL 33179. 305-944-0469 Supporting all systems.

1019-Commodore Association User Group (CAUG), c/o Juan Poggio, 11491 SW 103 Street, Miami, FL 33176. 305-279-9145 Supporting Commodore.

585-Miami Users Group, c/o Burt Schreiber, 19301 NE 19th Avenue, North Miami Beach, FL 33179. 305-931-3644 Supporting TI99/4A.

FOG A.M.O. 91--Ft. Lauderdale Computer Users Grou (FLCG), c/o Stephen Matus, 8461 NW 31st Place, Sunrise, FL 33351. 305-748-7237 Supporting CP/M, MS-DOS.

FL 407

503-Orlando FIG, c/o Herman B. Gibson. 407-855-4790 Supporting Forth.

748-Titusville Commodore Club. Supporting Commodore.

182-PC Users Group of Boca Raton, P.O. Box 273421, Boca Raton, FL 33427-3421. 407-498-8557 Supporting MS-DOS.

334-Atari Computer Club of Palm Beache, c/o Bob Shores, 128 S. Atlantic Dr., Boynton Beach, FL 33435. Supporting Atari.

168-Ft. Lauderdale Clipper User Group, 260 Lock Rd, Deerfield Beach, FL 33441. 407-395-3250 Supporting Clipper.

840-Fellsmere's Club Compu-Mania Inc., P.O. Box 629, Fellsmere, FL 32948-0629.

87-Central Florida Computer Society (CFCS), P. O. Box 8019, Maitland, FL 32751. 407-862-1329 Supporting all systems.

181-Greater Orlando 99ers User Group, P.O. Box 1381, Maitland, FL 32751. 407-774-0592 Supporting TI99/4A.

685-El-Shift-Oh Inc., P. O. Box 361348, Melbourne, FL 32936-1348. 407-773-1904 Supporting Commodore.

133-Space Coast Amiga User's Group, P. O. Box 2098, Merritt Island, FL 32952-2098. Supporting Amiga.

134-Space Coast Apple Users' Group Inc, c/o Elmer Whalley, P. O. Box 542112, Merritt Island, FL 32954-2112. 407-452-8357 Supporting Macintosh, Apple.

132-SW Techinical Products 6800 UG, 110 Dory Road North, North Palm Beach, FL 33408.

FOG A.M.O. 16--Greater Orlando Computer U G (GOCUG), c/o Martyn W. Simpson, 8142 Steeplechase Blvd., Orlando, FL 32818. 407-295-5689 Supporting CP/M, MS-DOS.

166-Orlando Clipper User Group, c/o C.N.Lee and Assoc, 5728 Major Blvd,Ste 200,Box 616686, Orlando, FL 32861. 407-351-2236 Supporting Clipper.

841-Apple Tree of Central Florida (ATOCF), c/o Ed Jones, 2810 Nela Ave, Orlando, FL 32809. 407-366-0060 Supporting Apple.

1005-Central Florida Amiga Club (CFAC), 4641 Salvia Drive, Orlando, FL 32809. 407-352-0951 Supporting Amiga.

1046-Mid FL Atari Computer Club, c/o Bill Baker, 2706 Rose Blvd, Orlando, FL 32809. 407-855-7080 Supporting Atari.

1196-Palm Beach Users Group (P.BUG), c/o Anne Fresoli, 5808 Golden Eagle Circle, Palm Beach Gardens, FL 33418. 407-622-9474 Supporting MS-DOS.

335-Stuart Area Commodore Club (STARCOM), P. O. Box 1446, Port Salerno, FL 33492. Supporting Commodore.

778-Brevard Users Group Inc (BUG), c/o Lee Jones, P. O. Box 37211, Satellite Beach, FL 32937. 407-724-8316 Supporting TI99/4A, MS-DOS, Tandy.

336-Marin County TI 99/4A Users Group, c/o Paul Yorke, 1200 Starfish Lane, Stuart, FL 33494. 407-287-1760 Supporting TI99/4A.

712-Treasure Coast PC User Club, c/o Chris Meier, 1700 S.E. Monterey Rd, Stuart, FL 33494. 407-286-4444 Supporting MS-DOS.

333-Space Coast PC Users Group (SCPCUG), P. O. Box 396, Titusville, FL 32781-0396. 407-269-7815 Supporting MS-DOS.

702-Alien UFO User Group, c/o George Constandakis, P. O. Box 5342, Titusville, FL 32783 + 5342.

110-Adam Users Group of W.P.B., c/o Randall Adams, 4757 #B Sunny Palm Circle, West Palm Beach, FL 33415. Supporting Adam.

FL 813

FOG A.M.O. 46--Tampa Bay Osborne Group (TBOG), c/o David W. Hardiman, 464 West Overbrook Street, Belleair Bluffs, FL 34640. 813-584-4185 Supporting CP/M, MS-DOS.

65-TI Personal Programmable Calculato, P.O. Box 1421, Largo, FL 34649. Supporting TI 59, TI 74, TI 95.

331-SW FL Apple Computer Keyboard Star (SWACKS), Rt. 2, Box 607, Palm Creek Drive, North Fort Myers, FL 33903. Supporting Apple.

131-Sarasota-Manatee Macintosh UG, P. O. Box 25134, Sarasota, FL 34277. 813-351-6632 Supporting Macintosh.

130-Pinellas IBM-PC Users Group, 1331 Seagull Drive South, St. Petersburg, FL 33707. 813-347-5444 Supporting MS-DOS.

203-EpSuncoast Users' Group, c/o Dick Lee, 1237 79 St S, St. Petersburg, FL 33707.

813-343-2668 Supporting Epson, MS-DOS, CP/M, TPM.

78-USF Personal Computer/System U.G. (USFPCUG), c/o SVC 409, USF UCS Info Center, Tampa, FL 33620-7250. 813-974-3190 Supporting MS-DOS, Apple, Unix, Macintosh.

169-Tampa Clipper User Group, 408 Courtney Dr, Tampa, FL 33617. 813-988-0191 Supporting Clipper.

184-Tampa UNIX User's Group, c/o University of South Florida, 4202 E. Fowler Ave., Tampa, FL 33620. Supporting Unix.

FL 904

636-Daytona Beach Amiga Comp Entusiast (DBACE), P. O. Box 10402, Daytona Beach, FL 32014. 904-761-4776 Supporting Amiga.

121-Computer Connection, P.O. Box 2101, Fort Walton Beach, FL 32549.

180-FWB Apple Users Group (FWBAC), c/o Bruce R. Aplin, 8 Michael Court, Ft Walton Beach, FL 32548. 904-862-3047 Supporting Apple.

1047-Emerald Coast Adam User's Group (ECAUG), c/o Faye Deere, P. O. Box 4934, Ft. Walton Beach, FL 32549-4934. 904-244-1516 Supporting Adam.

FOG A.M.O. 98--Jacksonville Osborne Users Group (JOUG), c/o Jacksonville Electric Authorit, 233 W. Duval Street, Jacksonville, FL 32201. 904-633-4750 Supporting CP/M, MS-DOS.

104-Timex Sinclair Users Group, c/o John Kuhn, 1707 King Street, Jacksonville, FL 32204. Supporting Timex Sinclair, Amstrad, CP/M.

964-Pc Users' Group of Jacksonville (PcUG), P. O. Box 47197, Jacksonville, FL 32247-7197. 904-272-3547 Supporting MS-DOS.

1292-Jax PCB Sysops Association, Jacksonville, FL. Supporting remote systems, telecommunications.

FOG A.M.O. 10--Pensacola FL Osborne Group (PFOG), c/o James W. Greene, 6230 Vicksburg Drive, Pensacola, FL 32503. 904-476-8083 Supporting CP/M, MS-DOS.

165-Pensacola Clipper User Group, 3208 North 6 Ave, Pensacola, FL 32503. 904-932-4988 Supporting Clipper.

1068-Pensacola PC Developers Group, c/o Valerie Baxter, 4659 Oakland Cr., Pensacola, FL 32506. 904-453-3840 Supporting dBASE, database.

664-Ft Walton Beach Commodore Users Gr (FWBCUG), P. O. Box 3, Shalimar, FL 32579. Supporting Commodore.

FOG A.M.O. 77--Tallahassee CP/M User Group (TCPMUG), c/o Spencer R. Lepley, 1655 Capital Circle S.E. # 12, Tallahassee, FL 32301. 904-878-4592 Supporting CP/M.

GA 404

1142-Atlanta Atari ST Users Group (ASTUG), c/o Steve Mays, 4504 Hickory Grove Dr, Acworth, GA 30101. 404-429-1346 Supporting MIDI (Programming sound).

FOG A.M.O. 93--The Osborne Group of Atlanta (TOGA), c/o William Woollett, 2018 Bramblewood Drive N.E., Atlanta, GA 30329. 404-457-4775 Supporting CP/M, MS-DOS.

19-Atlanta Computer Society (ACS), P. O. Box 88771, Atlanta, GA 30356. 404-435-9671 Supporting all systems.

185-Atlanta Data Base User Society (ADBUS), P.O. Box 19913, Atlanta, GA 30325. Supporting database.

339-Atlanta TI-99/4A Computer Users Gr (A9CUG), P. O. Box 19841, Atlanta, GA 30325. 404-231-0992 Supporting TI99/4A.

1115-Atlanta Area Apple Users Group (AAAUG), c/o Adele Ward, 868 Castle Falls Dr NE, Atlanta, GA 30329. 404-239-9118 Supporting Apple.

1116-Atlanta Color Computer Users Group (ACCUG), P.O. Box 450915, Atlanta, GA 30345. 404-264-0860 Supporting CoCo.

1117-Atlanta Data Base Users Group (ADBUS), P.O. Box 347005, Atlanta, GA 30334. 404-921-1881 Supporting database.

1118-Atlanta Desktop Publishers Assn (ATLDSKTP), c/o Bud Newcomb, 2100 Powers Fwy Rd. suite 125, Atlanta, GA 30339. 404-955-5656 Supporting Desktop Publishing.

1140-Atlanta Pick Users Group (AAPUG), c/o Steve Guthman, P.O. Box 1267, Atlanta, GA 30301. 404-971-7171 Supporting Pick.

1144-Business Users Group (BUSUSR), c/o AIBMPCUG, P.O. Box 28788, Atlanta, GA 30358. 404-977-0107 Supporting business, MS-DOS.

1145-Atlanta Clipper User Group (CLIPPER), c/o DSW and Assoc, 333 Sandy Springs Cr. NE Ste 229, Atlanta, GA 30328. 404-843-2775 Supporting Clipper.

1147-Computer Investing Group (COMPINV), c/o Henry Dunlap, 1141 Oxford Crescent, Atlanta, GA 30319. 404-255-1141 Supporting investing.

1149-Lotus Users Group (LOTUS), c/o AIBMPCUG, P.O.Box 28788, Atlanta, GA 30358. 404-977-0107 Supporting Lotus.

1152-Programmers Group (PROGRAMS), c/o AIBMPCUG, P.O. Box 28788, Atlanta, GA 30358. 404-446-0003 Supporting Programming, MS-DOS.

1156-TRS-80 Users Group (TRS80UG), 2581 Piedmont Td, Atlanta, GA 30324. 404-491-6601 Supporting Tandy.

1158-Women in Information Processing (WINPROC), c/o Sandra Bramlett, 1194 Beech Valley Rd, Atlanta, GA 30306. 404-874-8184

1185-NE Atlanta Color Computer Users (NEACC), P.O. Box 450915, Atlanta, GA 30345. 404-498-2496 Supporting CoCo.

25-CSRA Computer Society, P. O. Box 284, Augusta, GA 30903. 404-798-5513 Supporting all systems.

1121-Four Aces Users Group, P.O. Box 5698, Augusta, GA 30916. 404-796-2095 Supporting all systems.

582-Kaypro Users Group of Atlanta (KUG Atlanta), c/o Tim Farley, 124 Meredim Square, Columbia, SC 29223. 404-284-8593 Supporting Kaypro, MS-DOS, CP/M.

732-Organization of Atlanta SysOps Inc (OAS), P. O. Box 561, Decatur, GA 30031. 404-993-0080 Supporting remote systems, telecommunications.

1141-Atlanta Portable Computer Assoc (APCA), c/o Art Zorka, P.O. Box 33566, Decatur, GA 30033. 404-761-9687 Supporting Portable computers.

1151-PC Jr Users Group (PCJRUG), 3379 Spring Harbor Dr, Doraville, GA 30340. 404-452-0005 Supporting PCjr MS-DOS.

1155-Southeastern Computer Assoc (SECA), c/o Pete Snyder, 78 Howell Landing, Duluth, GA 30136. 404-476-7917

1105-Amiga Atlanta Inc. (AAI), 1511 Canaby Ct, Dunwoody, GA 30338. 404-394-0577 Supporting Amiga.

1146-Cobb County Lotus Users Group (COBBLUG), c/o John Calouro, 252 Rkustic Ridge Dr, Kennesaw, GA 30144. 404-926-2818 Supporting 1-2-3, Symphony.

963-LaGrange Area Micro Users Group (LAMUG), c/o Daniel H. Jones, 262 East Lakeview Drive, LaGrange, GA 30240. 404-884-4563 Supporting MS-DOS, Apple.

1154-Smart Users Group of Georgia (SUGG), 4925 Coldsprings Dr, Lilburn, GA 30247. 404-921-5600 Supporting Inovative Smart Software.

506-Atlanta Forth Interest Group, c/o Larry Daniels, 1500 Mill Creek Ct., Marietta, GA 30060. 404-428-0811 Supporting Forth.

1114-Artificial Intelligence Users (AIUG), c/o Allan H. Curry, 389 Chianquipin Dr, Marietta, GA 30064. 404-427-1094 Supporting Artificial Intelligence.

1148-Creative Paradox Users Group (CPU), c/o Heath Dyne, 1850 Parkway Place, 12th Floor, Marietta, GA 30067. 404-971-4159 Supporting Paradox.

1150-New Users Group (NEWUSRS), P.O. Box 965154, Marietta, GA 30066. 404-429-1036 Supporting MS-DOS, novices.

663-Atlanta IBM-PC Users' Group Inc., c/o Mark Strelecki, 2909 Langford Rd Ste A600, Norcross, GA 30071-1506. 404-446-6611 Supporting MS-DOS.

1139-Atlanta Macintosh Users Group (AMUG), P.O. Box 2941, Norcross, GA 30091. 404-231-9527 Supporting Macintosh.

1143-Atlanta Unix Users Group (AUUG), P.O. Box 2512, Norcross, GA 30091. 404-497-1902 Supporting Unix.

1157-Unix Beginners Group (UNIXBEGN), P.O. Box 1423, Norcross, GA 30091. 404-662-5391 Supporting Unix.

1153-Rbase Users Group (RBASE), c/o Zygonic Technololgies, P.O. Box 2251, Rosewell, GA 30077. 404-973-9285 Supporting Rbase.

GA 912

208-The Macon 99/4A Users's Group (MUG), c/o Don Alexander, 635 Villa Crest Ave, Macon, GA 31206. 912-781-0829 Supporting TI99/4A, Geneve.

HI 808

FOG A.M.O. 124--Hawaii Island Computor Assoc (HIFOG), c/o Shayne Enterprises, P.O. Box 895, Hilo, HI 96721-0895. 808-935-8678 Supporting CP/M.

8-Atari Computer Enthusiasts of HI (ACE-HI), P.O. Box 23076, Honolulu, HI 96822. 808-261-2209 Supporting Atari.

90-Oahu PC Users' Group, c/o Lionel Jaller, 400 Hobron Lane, #1802, Honolulu, HI 96815. Supporting MS-DOS.

94-Aloha Computer Club, Inc (ACC), P. O. Box 4470, Honolulu, HI 96812-4470. 808-537-2153 Supporting CP/M, MS-DOS, Heath Zenith.

IA 319

FOG A.M.O. 102--Quad City All Computers Users Grou (QC/ACUG), c/o Robert H. Lay, 1005 Canterbury Court, Davenport, IA 52806. 319-386-3484 Supporting CP/M, MS-DOS.

1126-Muscatine User Group Support (M.U.G.S.), 1836 Hershey Ave, Muscatine, IA 52761. 319-262-8276 Supporting Commodore.

447-Waterloo Area Commodore Club, c/o Steven D. Olsen, P.O. Box 2254, Waterloo, IA 50704-2254. 319-232-1062 Supporting Commodore.

IA 515

FOG A.M.O. 12--Midwest FOG (MWFOG), P.O. Box 2222, Ames, IA 50010-2222. 515-769-2223 Supporting CP/M, MS-DOS.

IA 712

FOG A.M.O. 38--Siouxland Osborne Group (SOG), c/o Gary Shaner, 3101 Norman Drive, Sioux City, IA 51104. 712-252-2182 Supporting CP/M, MS-DOS.

IL 217

845-TI 99/4a Users Group (WW99ER's), c/o Marc C. Levine, 3 Genevieve Lane, Champaign, IL 61821-7213. 217-351-0943 Supporting TI99/4A.

81-East Central TI User Group (ECUG), c/o Robert Wahlfeldt, 109 Iowa St, Danville, IL 61832. 217-446-7035 Supporting MS-DOS, Geneve.

IL 309

953-Quad City Computer Club (QCCC), 1005 -- 16th Street, Rock Island, IL 61201. 309-786-9635 Supporting Tandy.

4-Osborne Owners Peoria Society (OOPS), c/o Howard Morris, RD 2, Washington, IL 61571. 309-745-5034 Supporting CP/M, MS-DOS.

IL 312

609-No. IL Computer Hobbyist Exchange (N.I.C.H.E.). Supporting Apple, MS-DOS.

752-Northern Illinois Computer Society (NICS), P.O. Box 547, Arlington Heights, IL 60006. 312-577-7381 Supporting MS-DOS, Apple, Macintosh, Amiga.

782-Southwest Regional Area Programmer (SW.R.A.P./64), c/o T.O. Olson, P. O. Box 342, Bedford Park, IL 60499-0342. 312-656-7381 Supporting Commodore.

FOG A.M.O. 80--Chicago's First Osborne Group (CFOG), P. O. Box 1678, Chicago, IL 60690. 312-726-3569 Supporting CP/M, MS-DOS.

170-Chicago Clipper User Group, P.O. Box 578177, Chicago, IL 60657. 312-549-6618 Supporting Clipper.

350-Chicago Computer Society, P. O. Box 8681, Chicago, IL 60680-8681. 312-794-7737 Supporting MS-DOS.

970-Chicago Area Database Users Group (CADBUG), c/o David Merrill, P. O. Box 6898, Chicago, IL 60680-6898. 312-996-6366 Supporting database.

1138-Apple II Users Group, Des Plaines, IL. 312-827-1671 Supporting Apple.

592-Fox Valley Pet (Commodore) User Gr (FVP(C)UG), c/o Herb Gross, 833 Prospect, Elgin, IL 60120. 312-695-1316 Supporting Commodore, Commodore Pet.

1137-Apple IIGS Users Group, Lake Zurich, IL. 312-540-0733 Supporting Apple.

1135-IBM Users Group, Libertyville, IL. 312-362-7895 Supporting MS-DOS.

188-Chicago Area Computer Hobbyist Exc (CACHE), c/o Robert Bemis, 6720 Palma Lane, Morton Grove, IL 60053. 312-470-1664 Supporting all systems.

680-Lake County Amiga Users Group, c/o Philip R. Brauer, 0261 Elmwood Ave., Mundelein, IL 60060. 312-566-8846 Supporting Amiga.

1187-Fox Valley PC Association, P.O. Box 294, Plainfield, IL 60544. 312-231-1936 Supporting PCjr, MS-DOS.

1136-Macintosh Users Group, Roselle, IL. 312-894-7155 Supporting Macintosh.

1300-Board Users Syndicate (B.U.S.), P.O. Box 1112, South Holland, IL 60473. 312-331-4548

204-Computers Are Easy Users Group (CAEUG), P.O. Box 1328, Wheaton, IL 60189. 312-878-4300 Supporting MS-DOS, CP/M, Epson, TPM, Valdocs.

IL 618

355-IBM Jr User Group, P. O. Box 8012, Alton, IL 62002. Supporting PCjr.

454-Gateway Computer Club, Box 1839, Fairview Heights, IL 62208. Supporting MS-DOS.

354-Little Egypt Apple Users Group (LEAUG), P. O. Box 1122, Murphysboro, IL 62966. 618-684-4481 Supporting Apple.

190-Metro East Computer Association (MECA), c/o Dr. Tim Cooper, 911 Monterey Dr, O'Fallon, IL 62269. 618-624-8394 Supporting Apple, MS-DOS.

1098-ST Atari Resource Group (STar), c/o Ed Baker, 5478A Gray Plaza, Scott AFB, IL 62225. 618-746-4710 Supporting AtariST.

IL 815

141-Kankakee Hackers Commodore Users G, P.O. Box 267, Bradley, IL 60915. 815-935-5478 Supporting Commodore.

56-DeKalb Kaypro User's Group (DEKUG), P. O. Box 366, DeKalb, IL 60115. 815-756-5555 Supporting Kaypro.

IN 219

199-Elkhart PC User Group (EPCUG), P.O. Box 13, Elkhart, IN 46515-0013. 219-262-7312 Supporting MS-DOS.

97-Three Rivers Osborne Group, c/o Dewey D. Senger, 2410 Inwood Drive, Fort Wayne, IN 46815. 219-484-1487 Supporting Osborne.

992-Michiana Amateur Computer Society (MACS), c/o Don Lyons, P. O. Box 2171, Michigan City, IN 46360. 219-872-3610 Supporting all systems.

1094-Apple Users Group of Michiana (A.U.G.M.), c/o Paul Lee, 108 Eddy St. Apt. 207, Michigan City, IN 46360. 219-272-0825 Supporting Apple.

1051-Rochester Commodore Computer Club (RC3), c/o Curt Henriott, 428 Clay Street, Rochester, IN 46975. 219-223-5706 Supporting Commodore, Vic20, Amiga.

1052-Northern Indiana Apple Users Group (NInAUG), c/o Edward Szymoniak, 930 High Ridge Dr, Schererville, IN 46375. 219-663-3983 Supporting Apple][, Macintosh.

1123-Wabash Users Group, 1101 Colerain Street, Wabash, IN 46992. 219-563-8155 Supporting MS-DOS.

IN 317

850-Franklin, Laser Apple Group (F.L.A.G.), c/o M. Anthony, P.O. Box 1022, Crawfordsville, IN 47933-1022. Supporting Apple, MS-DOS.

FOG A.M.O. 126--The Central Indiana Kaypro-Osborne (CIKOG), c/o William B. Gillette, 6448 N. Ewing Street, Indianapolis, IN 46220. 317-253-9509 Supporting CP/M, MS-DOS.

573-Texas Instrument Hoosier User Grou (TI-HUGgers), P. O. Box 2222, Indianapolis, IN 46206-2222. Supporting TI99/4A.

973-Amerasia Desktop Publishing Group, c/o Ben Yanto, 5621 West Liberty Creek Drive, Indianapolis, IN 46254. 317-299-0440 Supporting Desktop Publishing.

1007-Commodore Hardware Users Group (C*H*U*G), c/o David White, P. O. Box 19637, Indianapolis, IN 46219. 317-862-4960 Supporting all Commodores.

1090-Indianapolis Computer Club, Inc. (ICC), P.O. Box 11367, Indianapolis, IN 46201. 317-783-1929 Supporting Commodore, MS-DOS.

FOG A.M.O. 34--Hoosier Osborne Group (HOG), c/o Peter Cook, 1903 East 430 South, Lafayette, IN 47905. 317-494-1914 Supporting CP/M.

200-Indiana Sinclair Timex Users Group (I.S.T.U.G.), c/o Frank Davis, 513 East Main St, Peru, IN 46970. 317-473-8031 Supporting Sinclair.

356-Miami Country Area TI 99/4A H U G, P. O. Box 1194, Peru, IN 46970. 219-563-2213 Supporting TI99/4A.

IN 812

FOG A.M.O. 87--Indiana Osborne Group (IOU), c/o Charles C. Foster, 4041 East Bethel Lane, Bloomington, IN 47401. 812-334-3234 Supporting CP/M, MS-DOS.

Users Groups

1204-Atari Sixteen Bit Users Group (ASBUG), c/o George V. Bowles', RR 12, Box 430a, Brazil, IN 47834. Supporting Atari.
193-Nationserv Users Group, c/o Ben Nation, 3960 Covert Avenue, Evansville, IN 47715. 812-477-5340 Supporting MS-DOS, Commodore, Tandy (BBS Only!).
645-Personal Computer Association (PCA), c/o David Bottomley, R.R. 5, Box 168V, Madison, IN 47250. 812-866-5511 Supporting MS-DOS.
138-QS! Alliance (QS! Alliance), P.O.Box 1403, New Albany, IN 47150. Supporting Commodore.

KS 316

206-Echo computer Users Group, c/o Cecil Kielhorn, Rt 1 Box 5, Cambridge, KS 67023. 316-467-2588 Supporting MS-DOS, TI99/4A.
FOG A.M.O. 137--Hutchinson Computer Hobbyists (HUTCH), c/o Stewart Investments, P. O. Box 374, Hutchinson, KS 67504. 316-662-7704 Supporting CP/M, MS-DOS.
FOG A.M.O. 21--Osborne Portable Enthusiast of KS (OPEK), c/o Norm Conley, 2916 West 21st, Wichita, KS 67203. 316-794-2151 Supporting CP/M, MS-DOS.

KS 913

1082-Greater Kansas City SysOps Assoc. (GKCSA), 3156 S. Wood View # 307, Kansas City, KS 66130. 913-236-5199 Supporting telecommunications, remote systems.
127-Topeka Osborne Group (TOG), c/o Philip B. Menninger, 1930 Webster Avenue, Topeka, KS 66604-3231. 913-234-3355 Supporting Osborne.
1220-Topeka PC Users Club (TPCUC), P.O. Box 1279, Topeka, KS 66601. 913-272-7832 Supporting MS/DOS.

KY 502

1003-Muhlenberg County Commodore Users (MCCUG), P. O. Box 12, Greenville, KY 42345. Supporting Commodore, MS-DOS, Amiga.
FOG A.M.O. 64--Personal Computer Club - Louisvill (PCCL), c/o David Creed, 1381 Tyler Park Drive, Louisville, KY 40204. 502-459-6127 Supporting CP/M.
1076-Kentuckiana 99/4A Computer Society, P. O. Box 36246, Louisville, KY 40233-6246. 502-491-2974 Supporting TI99/4A.

KY 606

FOG A.M.O. 32--Kentucky Osborne Group (KOG), c/o Robert A. Gibson, 412 Bristol Road, Lexington, KY 40502. 606-269-1684 Supporting CP/M.
361-Central KY Computer Society Inc (CKCS), 2050 Idle Hour Center Ste 160, Lexington, KY 40502. 606-255-3349 Supporting Commodore, MS-DOS, CP/M, Macintosh.
362-Bluegrass 99 Computer Society Inc, P. O. Box 11866, Lexington, KY 40578-1866. 502-863-4336 Supporting TI99/4A.
1217-Central Kentucky Autocad Users Grp, 2050 Idle Hour Center Ste 160, Lexington, KY 40502. 606-257-3650 Supporting AutoCAD, MS-DOS.

LA 318

697-Page User's Group (PAGE UG), P. O. Box 7703, Alexandria, LA 71306-7703. 318-473-8611 Supporting Commodore.
463-DeRidder Computer Club (DCC), c/o P.O.Box 1377, 212 W. Fourth St., De Ridder, LA 70634. 318-462-1753 Supporting Apple, Commodore, MS-DOS, Tandy.
1122-Southwest LA PC User Group (SWLAPCUG), P.O. Box 1124, Lake Charles, LA 70602.
627-Northeast Louisiana PC Users Group (NELA-PUG), c/o Mike Ravary, P. O. Box 7147, Monroe, LA 71211. 318-323-3710 Supporting MS-DOS, Tandy, Amiga.

LA 504

646-New Orleans Personal Computer Club (NOPC), P. O. Box 8364, Metairie, LA 70011. 504-455-5849 Supporting MS-DOS.
788-64'UM Commodore Computer User Grou (64'UM), P. O. Box 6481, Metairie, LA 70009-6481. 504-888-8025 Supporting Commodore.
1120-Attorneys Computer User Group, c/o Adolph J. Levy, 518 South Rampart Street, New Orleans, LA 70113. 504-586-9707 Supporting law.

MA 413

950-Pioneer Valley 99/4A Users Group, c/o Ray Wenninger, 111 Oakridge Street, Chicopee, MA 01020. 413-593-6951 Supporting TI99/4A.
854-Pioneer Valley PC Users Group (PVPCUG), P.O. Box H, N. Amherst, MA 01059. 413-253-2252 Supporting MS-DOS.
1011-Pioneer Valley Commodore Club (PVCC), c/o David Wolanin, 286 Sackett Road, Westfield, MA 01085. 413-568-0885 Supporting Commodore, MS-DOS.
1173-PolyLetter, c/o Ralph Kenyon, 191 White Oaks Road, Williamstown, MA 01267-2259. 413-458-3597 Supporting PolyMorphic Systems.

MA 508

120-Com-Rades Commodore Users Group (Com-Rades), 35 Hiltop Ave, Jefferson, MA 01322. 508-852-4279 Supporting Commodore.

MA 617

FOG A.M.O. 122--Boston Osborne Group (BCS SIG) (BOG), c/o John J. DeMeritt, 32 Willow Street, Belmont, MA 02178. 617-484-1863 Supporting CP/M, MS-DOS.
1-I.B.M. Users' Group (BCS SIG), c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting MS-DOS.
54-Amiga Users/Boston (BCS SIG), c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting Amiga.
365-Commodore Users Group (BCS SIG), c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-862-3675 Supporting Commodore.
486-Apple/Boston (BCS SIG), c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting Apple][&][GS.
600-Atari Boston User Group (BCS SIG) (A-BUG), c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting Atari.
771-Macintosh Users of Boston (BCS SIG, c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting Macintosh.
811-DEC Rainbow User/Boston (BCS SIG), c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting DEC Rainbow.
855-Boston Kaypro Users Group (BCS SIG, c/o The Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting Kaypro.
889-The Boston Computer Society (BCS), One Center Plaza, Boston, MA 02108. 617-353-8080 Supporting all systems.
1133-AtariST Users of Boston (BCS SIG), c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080 Supporting AtariST.
281-Mass Electronic Modem Operators (MEMO), c/o Kevin Cray, P.O. Box 3336, Fall River, MA 02722-3336. 617-673-5647 Supporting telecommunications.
853-Humane Engineering Aided by Roboti (HEART), P.O. Box 1261, Fall River, MA 02722. Supporting Robotic.
1091-Gosub Personnal Computer Users Grp (Gosub), c/o Larry G. Nelson Sr, 130 School St, Webster, MA 01570-4310.
172-Boston Computer Society Clipper SI, c/o Word Jenny, Inc, 539 Worcester St, Wellesley Hills, MA 02181. 617-235-3294 Supporting Clipper.
786-PCjr/Tandy 1000 Club of New Englan, c/o Steve Smith, 70 Loxwood Street, Worcester, MA 01604. 617-791-3258 Supporting PCjr, Tandy, MS-DOS.
1012-MUNCH, c/o Corson Wyman, P. O. Box 7193, Worcester, MA 01605. 617-839-4134 Supporting TI99/4A.

MD 301

860-Kaypro Users of Baltimore (KUB), P. O. Box 23510, Baltimore, MD 21203. 301-486-8361 Supporting CP/M, MS-DOS.
259-Baltimore Sanyo Users Group (BSUG), c/o David Chase, 101 N. Williams St, Bel Air, MD 21014. 301-879-2406 Supporting Sanyo.
FOG A.M.O. 101--Central MD Microcomputer User's Gr (CMMUG), c/o Paul Demmitt, 9337 Angelina Circle, Columbia, MD 21045. 301-381-4762 Supporting CP/M, MS-DOS, Commodore.
1181-National Computer Security Center, 9800 Savage Road, Fort Meade, MD 20755.
858-Lexington Park Atari Comp Enthusia (LPACE), c/o John J. Smith, 912 Chancellors Run Road, Great Mill, MD 20634. 301-862-1329 Supporting Atari.
972-TRS80/PC Users' Group, P. O. Box 2211, White Flint Mall, Kensington, MD 20895-0824. 301-770-7899 Supporting TRS-80 mod 1, 3, 4, Tandy, MS-DOS.
986-VQ-4pc Users Group, c/o Mike Taylor, 800 D Spyglass Way, Lexington Park, MD 20653. 301-863-5541 Supporting all systems.
210-Carroll Bits Users Group (CBUG), 314 Walgrove Rd, Reisterstown, MD 21136. 301-526-5826 Supporting Apple.
784-COMAL Special Interest Group (SIG), c/o Bob Bain, P. O. Box 2689, Silver Spring, MD 20902. 301-649-5964 Supporting Comal.
785-Montgomery Cty Commodore Comp Soc. (MCCCS), c/o Leonard Schachter, 1811 Quincy Street, NW, Washington, DC 20011. 202-291-2189 Supporting Commodore.

ME 207

716-Island/Reach Computer Users Group (I/RCUG), P. O. box 73, Deer Isle, ME 04627. 207-348-9917 Supporting all systems.
FOG A.M.O. 136--Southern Maine Osborne-CP/M Users (SMOG), c/o Carol M. Drake, RR3 Box 269, Kennebunkport, ME 04046. Supporting CP/M.
998-Amiga Users of Southern Maine, P. O. Box 10237, Portland, ME 04104. 207-797-4898 Supporting Amiga.
1073-Southern Maine Commodore Users Grp, c/o Rick Lembree, P. O. Box 416, Scarborough, ME 04074-0416. 207-967-3381 Supporting Commodore, Amiga, CP/M.

MI 313

FOG A.M.O. 37--The O Group of Ann Arbor (TOGA2), c/o Philip R. Yant, 3412 Oakwood, Ann Arbor, MI 48104. 313-764-4413 Supporting CP/M, MS-DOS.
894-Southeastern Michigan Computer Org (SEMCO), P.O. Box 02426, Detroit, MI 48202. 313-284-2816 Supporting all systems.
1194-Hacker's Guild of America, 19200 Freeland, Detroit, MI 48235. 313-935-7699
564-Genesee Atari Group (GAG), c/o Jim Steele, P.O. Box E, Flint, MI 48507. 313-736-4544 Supporting Atari.
1200-Mi Church Computer Users Network (MiCCUN), c/o Barb Esler, P.O. Box 1552, Troy, MI 48099. 313-479-1786 Supporting church applications.
FOG A.M.O. 14--DEtroit FOG (DEFOG), c/o Evelyn & Julian Prince, 3452 Buckingham Trail, W. Bloomfield, MI 48033. 313-626-6641 Supporting CP/M, MS-DOS.

MI 517

1190-Huron Computer Club, c/o Chris Cohen. 517-739-2445
1000-Saginaw Valley Computer Associatio, c/o Lynn Kauer, P. O. Box 1604, Bay City, MI 48706. 517-781-2516 Supporting MS-DOS.
1279-Mid-Michigan Microcomputer Group (M3G), c/o Michigan Computer Consortium, P.O. Box 1302, East Lansing, MI 48826-1302. 517-351-6300 Supporting all systems.
372-Capitol Hill Atari Owners Society (CHAOS), P. O. Box 16132, Lansing, MI 48901. 517-349-0404 Supporting Atari.
1062-Midland Commodore Computer Club (MCCC), c/o Rick Rosinski, 4702 Jefferson, Midland, MI 48640. 517-631-7162 Supporting Commodore.

MI 616

1001-Grand Rapids Apple Users' Group (GRApple), P. O. Box 1811, Grand Rapids, MI 49501. 616-866-1151 Supporting Apple][.

MN 218

FOG A.M.O. 118--Duluth Superior Ozzies (DSO), c/o Sanders J. Sweeney, 201 City Hall, Duluth, MN 55802. 218-626-3344 Supporting CP/M.

MN 612

FOG A.M.O. 111--Twin Cities Osborne Group (TCOG), P. O. Box 2163 Loop Station, Minneapolis, MN 55402. 612-871-6076 Supporting CP/M.
1134-Twin Cities PC User Group (TC PC UG), P.O. Box 10360, Minneapolis, MN 55458-3360. 612-888-0557 Supporting MS-DOS.
116-Twin Cities dBase Compiler User Gr, c/o Craig Yellick, 509 Maple Square, Wayzata, MN 55391-1036. 612-473-1805 Supporting dBase.

MO 314

862-St. Louis U G for the IBM PC (SLUG), 4849 Bogard, St Louis, MO 63128-4409. 314-968-0992 Supporting MS-DOS, Unix, Osborne.
FOG A.M.O. 55--Gateway CP/M Users Group (GatewayCP/M), P. O. Box 37022, St. Louis, MO 63141-1522. 314-831-8648 Supporting CP/M.
174-St. Louis Clipper User Group, 14 Coverly Way, St. Louis, MO 63126. 314-849-3975 Supporting Clipper.
921-St. Louis Kaypro Users' Group (SLKUG), c/o Chuck Bogardus c/o Words To Go, 925 DeMun Ave., St. Louis, MO 63105. 314-721-7766 Supporting CP/M, MS-DOS.
64-St. Peters Area computer Enthusias (S.P.A.C.E.), c/o First Capitol Computer, #16 Algana, St. Peters, MO 63376. 314-447-8697 Supporting MS-DOS.

MO 417

34-Springfield Computer Club, 3433-V2 S. Campbell, Springfield, NO 65807. 417-865-7377 Supporting MS-DOS, Tandy 1000, CP/M.
661-Springfield Apple Users Group, P. O. Box 3986, Springfield, MO 65808. 417-882-0323 Supporting Apple.

MO 816

375-Kansas City Atari Computer Enth (KC-ACE), P. O. Box 5286, Kansas City, MO 64112. 816-756-1532 Supporting Atari.
1034-Microcomputer Users Group (MUG), c/o Carl Mutch, P. O. Box 411436, Kansas City, MO 64141-1436. 816-587-8820 Supporting CP/M, MS-DOS.
FOG A.M.O. 97--Mizouri Osborne Group (MIZOG), c/o Floyd Bartley, 7400 Hadley, Overland Park, KS 66204. 913-722-3349 Supporting CP/M, MS-DOS.

MS 601

FOG A.M.O. 58--Mississippi Computer Society (MCS), P. O. Box 16417, Jackson, MS 39236-0417. 601-856-2509 Supporting CP/M, MS-DOS, TI99/4A.
757-North Bay PC Users Group, c/o Larry Corran, 216 Barbara Circle, Ocean Springs, MS 39564. 601-872-2506 Supporting all systems.

MT 406

960-Butte Atari Computer Club (BACC), c/o Bob Headval, Butte, MT. 406-494-4729 Supporting Atari.
912 Commodore Programs Inc. (CPI), c/o Bart Boggess, 740 Eastside Rd., Deer Lodge, MT 59722. Supporting Commodore.
719-Rattlesnake Atari Computer Enthusi (RACE), c/o Skip Leininger, 2110 Strand, Missoula, MT 59801. 406-728-2414 Supporting Atari.

NC 704

FOG A.M.O. 71--Local Osborne Group Including CP/M (LOGIC), c/o Don Williams, 2000 First Citizens Bank Plaza, Charlotte, NC 28202. 704-331-1549 Supporting CP/M, MS-DOS.
223-Charlotte Atari-Users Group (CAUG), c/o Ralph Oleski, P.O. Box 240313, Charlotte, NC 28224. 704-563-8765 Supporting Atari.
930-Charlotte Commodore Users Group (CCUG), P. O. Box 220189, Charlotte, NC 28222. 704-843-2819 Supporting Commodore.
1294-Charlotte Apple Computer Club (CACC), Charlotte, NC. Supporting Apple.
49-Charlotte Area Clipper User Group, 3101 Imperial Dr, Gastonia, NC 28054. 704-864-3269 Supporting Clipper.

NC 909

125-Greater Durham Raleigh Database UG, c/o San Sommer, 6410 Whitt Rd, Durham, NC 27712. 919-479-0631 Supporting MS-DOS, dBase.

NC 919

1035-Triangle Computer Society (TCS), P. O. Box 3588, Chapel Hill, NC 27515-3588. 919-968-4292 Supporting all systems.
FOG A.M.O. 107--Triad Region O Group Including CP/ (TROGIC), c/o Bill Morgan, 520 Merry Brook Court, Clemmons, NC 27012. 919-766-5530 Supporting CP/M.
177-Raleigh Clipper User Group, P.O. Box 15907, Durham, NC 27704. 919-688-3710 Supporting Clipper.
438-Raleigh Area Group Epson (RAGE), c/o Julie Sauvageot, 103 York, Garner, NC 27529. 919-772-8683 Supporting Epson, CP/M, MS-DOS, Valdocs.
864-Greensboro 80 Microcomputer Societ

(GEMS), P.O. Box 10014, Greensboro, NC 27404. 919-454-1580 Supporting MS-DOS, Tandy, CP/M, Commodore.
982-Greater Onslow Commodore User Grou, c/o Bruce & Kathy Theden, P.O. Box 7171, Jacksonvillle, NC 28540. 919-353-3339 Supporting Commodore, Amiga.
1087-Foothills User Group, c/o Mitchell Easter, 1012 Jesse Terrace, Mount Airy, NC 27030. 919-786-8640 Supporting Atari, Commodore, MS-DOS.
135-Triangle DataBase Users Group, c/o Dr. Richard W. Slatta, 3304 Dell Drive, Raleigh, NC 27609-7118. 919-737-2483 Supporting database.
866-The Triangle Computer Club (TCC), c/o Mike Stroud, 2213 Winiger Drive, Raleigh, NC 27603. 919-782-8122 Supporting MS-DOS.

ND 701

FOG A.M.O. 117--Osborne/Kaypro User's Group (O/KUG), P. O. Box 1372, Fargo, ND 58107. 218-222-1522 Supporting CP/M, MS-DOS.
662-Fargo IBM PC Users Group, P. O. Box 9121, Fargo, ND 58109. 701-232-3332 Supporting MS-DOS.
482-Minn. and Dakota Home Users Group (MAD HUG), c/o Dennis Schjeldahl, 509 Reeves Drive, Grand Forks, ND 58201. 701-772-6180 Supporting TI99/4A.

NE 402

FOG A.M.O. 39--Lincoln Local O Group (Lincoln LOG), c/o Wade Satterfield, 139 North 11th, #704, Lincoln, NE 68508. 402-477-9233 Supporting CP/M, MS-DOS.
383-Amiga Users of the HEARTLANDS (AUoH), P. O. Box 1432 DTS, Omaha, NE 68101-1432. 402-571-1393 Supporting Amiga.
1197-Omaha Adam Users Club (O.A.U.C.), Omaha, NE. Supporting Adam.

NH 603

730-Ms.Dos Users Group, c/o Fred Schulz, P. O. Box 153, Barrington, NH 03825. 603-664-7638 Supporting MS-DOS.
10-Nashua Area ST User Society (NASTUS), c/o Dave Hamel, Webster Highway, Temple, NH 03084. 603-922-6602 Supporting AtariST.

NJ 201

989-New Jersey PC Users Group (NJPC), P.O. Box 411, Calstadt, NJ 07072. 201-664-3311 Supporting MS-DOS.
1160-Monmouth Apple Corp, c/o George McBride, 113 Monroe St, Eatontown, NJ 07724-3308. 201-542-3829 Supporting Apple][.
940-International IBM User Group, c/o David Habler, 112 Old Bridge Road, Matawan, NJ 07747. Supporting MS-DOS.
915-Jersey Amiga Users Group (JAUG), c/o Eric Lavitsky, P.O. Box 1986, New Brunswick, NJ 08901. 201-563-9056 Supporting Amiga.
293-Jersey Atari Computer Group (JACG), c/o Robert Mulhearn, 8 Crescent Rd, Pine Brook, NJ 07058. 201-575-0067 Supporting Atari, CP/M, MS-DOS, Macintosh.
386-Garden State Commodore User Grp In (GSCUG), c/o Robert McKinley Jr., 89 Stratford Road, Tinton Falls, NJ 07724. 201-542-2113 Supporting Commodore, MS-DOS, Amiga.
39-New Jersey On-Line AutoCAD Users G (NJOAUG), c/o Barry Wesserman, 4 Korwel Court, West Orange, NJ 07052. 201-669-8414 Supporting all, systems.
FOG A.M.O. 138--JOG Computer Club (JOG), P. O. Box 464, Westfield, NJ 07091-0464. 201-233-0202 Supporting CP/M, MS-DOS.
175-Clipper Club of New Jersey, c/o 552 Blvd., Westfield, NJ 07090. 201-233-0202 Supporting Clipper.

NJ 609

969-Fort Dix PC Users Group, c/o Jose Lebron, P. O. Box 233, Fort Dix, NJ 08640. 609-562-5619 Supporting MS-DOS.
387-Central Garden State Users' Group (CGSUG), c/o Mr & Mrs. G. Pearson, 61 Country Lane, Hamilton Sq, NJ 08690. 609-758-7729 Supporting TI99/4A, Geneve.
1210-Central Jersey Computer Club, c/o Rich Williams, RD #1 Box 147 County Rte #518, Hopewell, NJ 08525. 609-466-0909 Supporting all systems.
1211-Mid-Jersey PC Group, c/o Grad. Prgrm. for Admin, Rider Col., 2083 Lawrenceville, Lawrenceville, NJ 08648. 609-896-5350 Supporting MS-DOS.
1209-Atlantic Comm College Computer Clu, Rte. 322, Mays Landing, NJ 08330-9888. 609-343-4994 Supporting all systems.
736-South Jersey IBM PC Users Group (SJ IBM PCUG), P. O. Box 1117, Ocean City, NJ 08226-1117. 609-345-4712 Supporting MS-DOS.
1208-Stockton State College Computer So, c/o Mrs. Diane Ross, Off of Campus Act Stockton St Col, Pomona, NJ 08240-9988. 609-652-4205 Supporting all systems.
109-Dynabyte Users Group, c/o George Szerw, Box 502, Rencocos, NJ 08073. 609-261-7204 Supporting Dynabyte.
1213-Princeton IBM PC Users Group, P.O. Box 291, Rocky Hill, NJ. Supporting MS-DOS.
616-Computer Club of Ocean County (CCOC), c/o Mike Marotta, P. O. Box 744, Toms River, NJ 08754. 609-693-9575 Supporting Tandy, MS-DOS, CoCo.

NM 505

FOG A.M.O. 127--Albuquerque Osborne Group (AOG), c/o Mokler Associates, 7800 Phoenix N.E., Suite E, Albuquerque, NM 87110. 505-822-9607 Supporting CP/M, MS-DOS.
1102-Timex Sinclair Amateur Radio User, c/o Alex Burr, 2025 O'Donnell, Las Cruces, NM 88001. 505-522-2528 Supporting Timex Sinclair.

NV 702

FOG A.M.O. 25--Vegas Osborne Group (VOG). Supporting CP/M.
473-Timex/Sinclair User Gp of Las Vega, 1003 East Bonanza Road, Las Vegas, NV 89101. 702-386-3054 Supporting Timex Sinclair.
870-Silver State Computer User's Group, P.O. Box 81075, Las Vegas, NV 89180. 702-438-2600 Supporting Apple, Commodore, MS-DOS, Atari.
952-Nevada U G for Electronic Telecomm (NUGET), 3990 Las Vegas Blvd North #245, Las Vegas, NV 89115. Supporting MS-DOS, Tandy, TRS-80.

NY 212

698-Bronx-64 Users Group (BUG-64), c/o Bruce Roberts, P. O. Box 523, Bronx, NY 10475. Supporting Commodore.
FOG A.M.O. 135--New York Osborne Users' Group (NYOUG), P. O. Box 20435, Midtown Station, New York, NY 10129. 914-723-0548 Supporting CP/M.
470-New York Personal Computer Inc. (NYPC), 40 Wall Street, Suite 2124, New York, NY 10005. 212-533-6972 Supporting MS-DOS.
480-N.Y. Lap Users Group (NY LUG100), c/o Sarah Stambler, 370 Central Park West - #210, New York, NY 10025. 212-222-1713 Supporting MS-DOS laptops.
981-Creative Computing Club, 153 East 57th Street #8G, New York, NY 10022. 212-888-3953 Supporting CP/M, MS-DOS, novices.
1188-MUSIG- Midi User Group (MUSIG), c/o Charlie Miller, 362 W 52 St, New York, NY 110019. 212-246-7438 Supporting MIDI.

NY 315

389-Students & Teachers Computer UG, c/o Nick Dudish, Gros Blvd, Herkimer, NY 13350. Supporting education.
FOG A.M.O. 82--Syracuse Osborne User's grouP (SOUP), c/o Gobind Singh Khalsa, 8371 Redwing Drive, Liverpool, NY 13090. 315-622-9209 Supporting CP/M.
472-Atari Comp Enthusiasts of Syracuse (ACE of Syracuse), c/o Fred T. Dunaway, 126-1/2 Old Liverpool Road, Liverpool, NY 13088. 315-451-2403 Supporting Atari.
449-Central New York Commodore Users G (CNYCUG), c/o Sid Chong, 6887 Peck Road, Syracuse, NY 13209. 315-638-2378 Supporting Commodore, Vic20, Amiga, MS-DOS.
823-Commodore Computer Club of Syracus, P. O. Box 2232, Syracuse, NY 13220. Supporting Commodore.

NY 516

118-Long Island Texas Instr 99er U.G. (LITI 99ers), P.O. Box 544, Deer Park, NY 11729. 516-938-1095 Supporting TI99/4A.
604-Long Island Computer Association (L.I.C.A.), P. O. Box 71, Hicksville, NY 11802. 516-293-8368 Supporting all systems.
176-Suffolk Clipper User Group, c/o 1st Byte, Drawer 'T', Remsemburg, NY 11960. 516-325-8945 Supporting Clipper.
391-Suffolk Apple Computer Club (SACC), P. O. Box 349, Smithtown, NY 11787. 516-360-0797 Supporting Apple.
579-Long Island Sinclair Timex Group (LIST), c/o Harvey Rait, 5 Peri Lane, Valley Stream, NY 11581. 516-791-6247 Supporting Sinclair.

NY 518

1072-Greater Plattsburgh Commodore U. G (GPCUG), P.O. Box 392, Plattsburgh, NY 12901. 518-561-7869 Supporting Commodore, Amiga.
898-Burnt Hills Apple Group (Mixed BHAG), c/o Bill Shuff, 1524 Myron Street, Schenectady, NY 12309. 518-393-9753 Supporting Apple.
957-Mixed Burnt Hills Apple Group (Mixed BHAG), c/o Peter Terzian, 141 Seeley Street, Scotia, NY 12302. 518-399-5751 Supporting Apple.

NY 607

217-Sinclair Computer Users Society (SINCUS), c/o Paul Hill, 1229 Thodes Rd, Johnson City, NY 13790. 607-798-7219 Supporting Sinclair.

NY 716

FOG A.M.O. 129--NIAgara FRontier Osborne Group (NIAFROG), c/o Robert W. Spencer, 238 Sterling Avenue, Buffalo, NY 14216. 716-832-8671 Supporting CP/M, MS-DOS.
1169-Shak Pak, c/o Gail Allore, P.O. Box 1025, Lockport, NY 14094. 716-433-7176 Supporting Coco, MS-DOS.
FOG A.M.O. 132--First Rochester Osborne Group (FROG), 350 Chili Avenue, Rochester, NY 14611. 716-232-7272 Supporting CP/M, MS-DOS.
395-Atari Computer Owners of Rochester (ACORN), c/o Bruce 'elson, 120 Cobblestone Dr, Rochester, NY 14623. 716-334-5513 Supporting Atari.

NY 718

397-Sheepshead Bay Computer Group (SBCG), 2546 East 24th Street, Brooklyn, NY 11235. 718-934-8926 Supporting MS-DOS.
150-New York Metro Clipper User Group (NYMCUG), 75-22 182 St, Flushing, NY 11366-1614. 718-380-6175 Supporting MS-DOS.
154-Prof Assoc of Database Developers (PADD), 75-22 182 St, Flushing, NY 11366-1614. 718-380-6075 Supporting MS-DOS, Macintosh, Unix.
873-Apple/IBM User's Group, c/o Greg Trobaugh, 39-44 24th Street, Long Island City, NY 11101. 718-482-0088 Supporting Apple, MS-DOS.

NY 914

398-Central Westchester 99'ers, c/o Al Trudeau, 7 Taylor Road, Elms Ford, NY 10523. 914-592-2080 Supporting TI99/4A.
213-Hudson Valley PC Club (HVPCC), Box 6057, Kingston, NY 12401. Supporting MS-DOS.
FOG A.M.O. 104--Westchester Osborne Group (WOG), c/o Alfred Stamm, 33 Stratton Road, Scarsdale, NY 10583. 914-725-1098 Supporting CP/M, C-128, MS-DOS.
874-County of Rockland Apple Branch (CRAB), P.O. Box 268, West Nyack, NY 10994. 914-359-6694 Supporting Apple.

OH 216

FOG A.M.O. 44--AKCAN Osborne Users Group (AKCAN), c/o Terry Slingluff, 705 2nd Street NE, Canton, OH 44704. 216-454-3229 Supporting CP/M, MS-DOS.
FOG A.M.O. 75--Cleveland Osborne Group (COG), c/o Peter S. Tippett, 2135 Renrock, Cleveland Heights, OH 44118. 216-888-2078 Supporting CP/M, MS-DOS.
178-Ohio North Coast Clipper User Grou, c/o Cedar Hill Development Corp, 2105 Stillman Rd, Cleveland Heights, OH 44118. 216-397-0617 Supporting Clipper.
229-Northern Ohio Business Users Group (NOBUG), 571 East 185th St., Euclid, OH 44119. 216-944-5800 Supporting Tandy, CP/M, MS-DOS.
717-TI Chips Users Group, c/o John Parken, 4172 West 217, Fairview Park, OH 44126. 216-331-2830 Supporting TI99/4A.
1129-North East Ohio ST Atari Group (NEO STAG), P.O. Box 45, Girard, OH 44420. Supporting Atari.
1039-Lake-Ashtabula IBM PC Users Group, P. O. Box 175, Madison, OH 44057-0175. Supporting MS-DOS.
399-Basic Bits Commodore Group, P.O. Box 447, No Ridgeville, OH 44039-0447. 216-365-2101 Supporting Commodore.
FOG A.M.O. 9--Oberlin Computer Users Group (/Ob/Os), c/o Art Ripley, Box 5A OCMR, Oberlin, OH 44074. 216-775-8706 Supporting CP/M, MS-DOS.
635-TRUMCUG (C64/128/A500) (TRUMCUG), c/o Bob Summers, P. O. Box 8632, Warren, OH 44484. Supporting Commodore.
160-Triway MS-DOS Users' Group, c/o L.A. Umbach, 2527 Armstrong Dr., Wooster, OH 44691. 216-345-5637 Supporting MS-DOS.

OH 416

46-Lima Area TI99/4A User Group, P.O. Box 647, Venedocia, OH 45894. 419-667-3131 Supporting TI99/4A, Geneve.

OH 419

875-Toledo Area Tandy Special Interest (TATSIG), 3425 Fleitz Road, Oregon, OH 43616. 419-856-3721 Supporting Tandy.

OH 513

1013-Commodore Comp. Club of Cincinnati (CCCC), P. O. Box 152, Camp Dennison, OH 45211. 513-271-7215 Supporting Commodore.
FOG A.M.O. 27--Cincinnati Osborne Group (COG), c/o Terradise Computer Systems, 6404 Coffey Street, Cincinnati, OH 45230. 513-232-4076 Supporting CP/M, MS-DOS.
1192-SouthWestern Ohio Commodore Users (S.W.O.C.U.G.), P.O. Box 46644, Cincinnati, OH 45246. 513-825-1554 Supporting Commodore.
FOG A.M.O. 79--Dayton Osborne Users Group (DOUG), c/o Dayton Pro Photo, Box 534, Dayton, OH 45419. 513-293-9061 Supporting CP/M, MS-DOS.
401-Dayton Microcomputer Assoc, Inc (DMA), c/o Dayton Museum of Natural Histo, 2629 Ridge Avenue, Dayton, OH 45414-5499. 513-252-1230 Supporting all systems.
1206-Dayton Area Sanyo Users (DASUG), Dayton, OHIO. 513-978-4542 Supporting Sanyo.
1207-Dayton TRS-80 Users Group (DAYTUG), Dayton, OH. 513-372-6146 Supporting TRS-80.
990-Dayton MSDos Users Group (DMUG), c/o James Gundel, 3000 Pascal Dr, Fairborn, OH 45324. 513-259-0806 Supporting MS-DOS.
1043-Miami Valley Atari Comp Enthusiast (MV ACE), c/o Tom Curtner, P. O. Box 24221, Huber Heights, OH 45424. 513-837-3628 Supporting Atari.
1174-Dayton Area Commodore Users Group (DACUG), c/o Mona Spurgeon, 1117 Lavern Avenue, Kettering, OH 45429. 513-298-6743 Supporting Commodore.
632-Cincinnati-Dayton TI-99 Users Grou (Cin-Day), c/o Rick Kellogg, 416 Pinewood Avenue, Piqua, OH 45356-2622. 513-773-5941 Supporting TI99/4A.

OH 614

1128-Newark Area Computer Club Inc., P.O. Box 108, Thornville, OH 43076. 614-345-4577 Supporting Atari, Commodore, MS-DOS.

OK 405

639-Greater Enid MS-DOS User Group, c/o Ron Lukenbaugh, 905 Freeland, Enid, OK 73701. 405-237-5634 Supporting MS-DOS.
724-Northwest MS-DOS User Group, c/o Ron Lukenbaugh, 905 Freeland Drive, Enid, OK 73701. 405-233-1678 Supporting MS-DOS.
1083-Vance Basewide User's Group (VBUG), c/o Mr. Carol Miller, P. O. Box 848, Enid, OK 73702-0848. 405-249-7314 Supporting ConvTech, MS-DOS.
1198-International Elect. Musician's U. (IEMUG), P.O. Box 30995, MidWest City, OK 73140. Supporting MIDI (computers and music).
FOG A.M.O. 67--OKlahoma City Personal Computers (OKCPC), c/o William S. Cooter, 1809 Vanessa Drive, Norman, OK 73071. 405-360-2141 Supporting CP/M, MS-DOS.
233-Tinker Atari Computer Enthusiasts (TACE), c/o Mike Beard, P. O. Box 19456, Oklahoma City, OK 73144. 405-793-7978 Supporting Atari, MS-DOS.
751-Central OK Computer Organization (COCO), P.O. Box 60831, Oklahoma City, OK 73146. 405-733-8531 Supporting Tandy, CoCo.
1004-Sooner 99'ers, c/o Garth Potts, 12513 Hickory Hollow Drive, Oklahoma City, OK. 405-949-0111 Supporting TI99/4A, Geneve.

OK 918

FOG A.M.O. 51--Osborne Users of Tulsa (OUT), c/o James R. Roop, 1632 S. Denver, Tulsa, OK 74119-4233. 918-587-3918 Supporting CP/M.
232-Green Country Computer Association (GCCA), P.O. Box 497, Tulsa, OK

Users Groups

74101-0497. 918-245-6217 Supporting all systems.
441-Tulsa Computer Society (TCS), P. O. Box 3211, Tulsa, OK 74101. Supporting all systems.
442-Tulsa Area Sysops Council, P. O. Box 580665, Tulsa, OK 74158. 918-585-2552 Supporting telecommunications.

OR 503

FOG A.M.O. 128--Lane Osborne CP/M Users Group (LOCUG). 503-747-8242 Supporting CP/M.
749-Salem Area Computer Club (SACC). Supporting all systems.
26-Eugene 99/4A Users' Group (Eugene T.I.U.G.), P.O. Box 11313, Eugene, OR 97440. 503-998-3590 Supporting TI99/4A.
1189-Lane County Commodore User Group (LCCUG), P.O. Box 11316, Euguene, OR 97440. 503-935-4258 Supporting Commodore.
1179-Jefferson State Computer User Grou, P.O. Box 4335, Medford, OR 97501. Supporting all systems.
FOG A.M.O. 57--Portland Micro Computer Society (PMS), c/o Educational Research Associate, 333 SW Park Avenue 4th Floor, Portland, OR 97205-3784. 503-228-6345 Supporting CP/M.
747-Portland PC Club, 921 S.W. Morrison Suite 529, Portland, OR 97205. 503-226-4143 Supporting MS-DOS.
980-Northwest Sanyo Enthusiasts (NWSE), P. O. Box 66173, Portland, OR 97266. 503-761-1937 Supporting Sanyo, MS-DOS.

PA 215

796-Delaware Valley Apple Branch (DVAB), c/o Gary S. Baron, P. O. Box 30, Bryn Mawr, PA 19010. 215-687-3202 Supporting Apple.
879-Clifton Heights User's Group (CHUG), P.O. Box 235, Clifton Heights, PA 19018.
1295-LowerBucks User Group (LUG), P.O. Box 397, Croydon, PA 19020-0959. 215-945-0672 Supporting MS-DOS, Amiga, CP/M, Commodore, Macinto.
1212-Philadelphia Area IBM PC Club (PAC), 2041 Harbour Drive, Palmyra, NJ 08065. 215-951-1255 Supporting MS-DOS.
1216-Independence Sqr PC jr User Group, 600 Arch St. 6th Fl., Philadelphia, PA 19106. Supporting PCjr, MS-DOS.
FOG A.M.O. 121--Philadelphia Region O Group (PhROG), c/o John W. Houriet, 2525 Turner Road, Willow Grove, PA 19090. 215-657-5608 Supporting CP/M, MS-DOS.
1214-Corporate PC Users Group, c/o Ken Taylor, P.O.Box P, Willow Grove, PA 19090. 215-657-7269 Supporting MS-DOS.

PA 412

994-Personal Computer - Butler Users G (PCBUG), c/o Jeffry Long, P. O. Box 1041, Butler, PA 16003-1041. 412-285-8305 Supporting MS-DOS.
70-Airport Area Computer Club (AACC), P.O. Box 710, Coraopolis, PA 15108. 412-262-2138 Supporting TI99/4A, Geneve 9640.
FOG A.M.O. 50--Three Rivers Osborne Group (TROG, PA), P. O. Box 23152, 4th Ave. Station, Pittsburgh, PA 15222. 412-661-2446 Supporting CP/M, MS-DOS.
630-Pittsburgh Area Computer Club (PACC), P. O. Box 6440, Pittsburgh, PA 15212. 412-367-7549 Supporting all systems.
707-Pittsburgh Atari Computer Enthusia (PACE), P. O. Box 13435, Pittsburgh, PA 15243. 412-963-6180 Supporting Atari.
1057-Pittsburgh User's Group, c/o Gary Taylor, P. O. Box 8043, Pittsburgh, PA 15216. 412-341-6874 Supporting TI99/4A.
460-Computers and Learning, c/o Donna Vargo (CAL), P.O.Box 343, Valencia, PA 16056. Supporting MS-DOS.

PA 717

878-Eight Squared: Central PA Commodor (82), P.O. Box 249, Camp Hill, PA 17011. 717-944-7353 Supporting Commodore.
618-Harrisburg PC User Group (HUG), c/o Jack Stahl, 1195 Fairmont Drive, Harrisburg, PA 17112. 717-652-9097 Supporting MS-DOS.
FOG A.M.O. 74--Lancaster Micro-Users Group (L-MUG), c/o Allen H. Eshleman, 3624 Horizon Drive, Lancaster, PA 17601. 717-285-4940 Supporting CP/M, MS-DOS.
FOG A.M.O. 92--Mid-Pennsylvania Osborne Group (MidPOG), P. O. Box 287, Lemoyne, PA 17043. 717-763-7064 Supporting CP/M, MS-DOS.

PA 814

762-Bottom of Barrel Apple Users Group, c/o Ben Morgan Jones, 2613 - 8th Avenue, suite 3B, Altoona, PA 16602. 814-946-1423 Supporting Apple, Macintosh.
1193-North Coast Commodore Users Group (NCCUG), P.O. Box 6117, Eire, PA 16512-6117. 814-899-9239 Supporting Commodore.
1048-Computer Users of Erie (CUE), c/o Mike Daly, P. O. Box 1975, Erie, PA 16507-0975. Supporting CoCo, MS-DOS.
240-Nittany Users of Texas Instruments (NUTI), 625 Wiltshire Drive, State College, PA 16803. 814-238-0396 Supporting TI99/4A, Geneve.

SC 803

1086-Commodore Peek and Poke Society (CPPS), c/o Jeff Blocker, P.O. Box 71872, Charleston, SC 29415-1872. Supporting Commodore.
975-Rock Hill Atari Computer Enthusias (RHACE), c/o Casey Munn, 220 Peachtree Road Rt. 6, Rock Hill, SC 29730. 803-329-4546 Supporting Atari, AtariST.

SD 605

467-Siouxland 99ers, 4604 Bluestem Circle, Sioux Falls, SD 57106. Supporting TI99/4A.
880-Apple Core of Siouxland, c/o William J. Reynolds, P.O. Box 90002, Sioux Falls, SD 57105. 605-334-4391 Supporting Macintosh, Apple.

TN 615

799-Cumberland Microcomputer Users Grp (CMUG), P. O. Box 2094, Cookeville, TN 38502. 615-372-3305 Supporting all systems.
737-East Tennessee PC User Group (ETPCUG), c/o Jim Calloway, 637 Woodlawn Pike, Knoxville, TN 37920. 615-577-0935 Supporting MS-DOS.
1301-Knoxville Atari Users Group (KAUG), P.O. Box 121752, Knoxville, TN 37212. 615-868-0843 Supporting Atari, AtariST.
FOG A.M.O. 119--Nashville CP/M Users Group (NCP/MUG), P. O. Box 24606, Nashville, TN 37202-4606. 615-792-7778 Supporting CP/M.
62- Music City PC Users Group, P.O. Box 121633, Nashville, TN 37212-1633. 615-662-0322 Supporting MS-DOS.
608-Nashville Commodore Users Group, c/o Carl Manka, P. O. Box 121282, Nashville, TN 37212. 615-889-8749 Supporting Commodore, MS-DOS.
FOG A.M.O. 13--Smoky Mountain Osborne Group (SMOG), P. O. Box 171, Oak Ridge, TN 37831-0171. 615-483-6857 Supporting CP/M.
1100-The 64-K, c/o Howard S. Bacon, 213 Holly Ave, So. Pittsburg, TN 37380-1313. Supporting Atari, CoCo, Commodore, Vic20.

TN 901

410-Mid-South TI-99/4A Users Group, P. O. Box 38522, Germantown, TN 38183-0522. 901-358-0667 Supporting TI99/4A.
FOG A.M.O. 15--Memphis Osborne Group (MOG), c/o Isaac L. Kullman, 2753 Woodland Hills Cove, Memphis, TN 38127. 901-358-8128 Supporting CP/M, MS-DOS.
704-Memphis Color Computer Users Group (MCCUG), P. O. Box 11736, Memphis, TN 38111-1736. 901-386-8452 Supporting CoCo.
814-Memphis-East Commodore Organizatio (MECO), c/o Dwight Campbell, 6870 Sauterne Cove, Memphis, TN 38115. 901-362-6929 Supporting Commodore.

TX 214

179-Dallas Clipper User Group (dCUG), 4005 Brookhaven Club Dr #257, Dallas, TX 75244. 214-406-9101 Supporting Clipper.
1023-Dallas Timex/Sinclar/Amstrad U.G. (ST/S/A UG), c/o Frank Bouldin, 4424 Geddes Ave, Ft. Worth, TX 76107. 214-252-5622 Supporting Timex Sinclair, Amstrad, CP/M, MS-DOS.
1024-Fort Worth Timex/Sinclair Users Gr, c/o David Baulch, 4424 Geddes Avenue, Ft. Worth, TX 76107. Supporting Timex Sinclair.
884-Laptop Users of Texas, 1913 Dalworth Street, Grand Prarie, TX 75050. Supporting MS-DOS laptops.

TX 409

FOG A.M.O. 41--Loeal Osborne Group (LOG), c/o Gary Teaney, 2680 Long, Beaumont, TX 77702. 409-832-8369 Supporting CP/M.
1032-Golden Triangle PC Club (GTPCC), c/o J.C. Allen, Editor, 7360 Concord Road, Beaumont, TX 77708. 409-898-2191 Supporting MS-DOS.
FOG A.M.O. 43--AGGi Non-profit Osborne Group (AGGNOG), c/o Gary Smith, 4106 Willow Oak, Bryan, TX 77802-3636. 409-845-9184 Supporting CP/M, MS-DOS.
105-Pastor's User Group (PUG), Drawer O, Hempstead, TX 77445. Supporting TI99/4A.

TX 512

FOG A.M.O. 7--A E I O U (AEIOU), c/o Jim Dunn, 4506 Cumbria Lane, Austin, TX 78727. 512-836-3010 Supporting CP/M, MS-DOS.
FOG A.M.O. 18--South Texas Osborne Group (STOG), c/o Banjo Distributing Co., 602 Moorside Drive, San Antonio, TX 78239. 512-654-0241 Supporting CP/M, MS-DOS.
1080-Alamo PC Organization (APCO), c/o Olympia Secretarial Ctr, 8347 Delphian, Universal City, TX 78148. 512-658-0561 Supporting MS-DOS.

TX 713

1063-Bay Area GS User's Group, c/o Michael Sayer, P. O. Box 630, Channelview, TX 77530. Supporting Apple.
FOG A.M.O. 76--Osborne Users Club, Houston (OUCH), c/o Bruce Wilson, 10510 Tradewinds, Houston, TX 77086. 713-931-1096 Supporting CP/M.
183-Houston Area Clipper User Group, 2300 S. Gessner, #118, Houston, TX 77063. 713-266-1640 Supporting Clipper.
198-Houston Copperfield/Bear Ck IBM PC, c/o Steve Brown, 8034 Pine Falls Dr, Houston, TX 77095. 713-859-7741 Supporting MS-DOS.
745-Houston Atari Computer Enthusiasts (HACE), P. O. Box 460212, Houston, TX 77056-8212. 713-661-5751 Supporting Atari, AtariST.
892-Houston Area League of PC Users (HAL/PC), P. O. Box 61266, Houston, TX 77208. 713-447-3800 Supporting MS-DOS.
1203-1960 PC Users Group, P.O. Box 681895, Houston, TX 77268-1895. 713-440-5784 Supporting MS-DOS.
FOG A.M.O. 108--CLOG (CLOG), P. O. Box 57613, Webster, TX 77598. Supporting CP/M, MS-DOS.

TX 806

FOG A.M.O. 28--Panhandle Osborne Group (POG), c/o Robert O. McNeil, 3028 N.E. 26th, Amarillo, TX 79107. 806-355-7509 Supporting CP/M.
566-Quantum Leap User Group (QLUG), c/o Gale Henslee, 4411 West 2nd Avenue, Amarillo, TX 79106. Supporting Timex Sinclair.
983-Amarillo 99/4 Users Group (AUG), c/o Samuel R. M. Burton, P. O. Box 8421, Amarillo, TX 79114. 806-352-4778 Supporting TI99/4A, Geneve.
FOG A.M.O. 134--Lubbock Osborne Group (LOG), c/o John Krahmer, 4901 77th Street, Lubbock, TX 79424. 806-742-3920 Supporting CP/M, MS-DOS.

TX 817

1298-Fort Worth Komputer Users Group (FWKUG), c/o Craig Verwers. 817-763-0261 Supporting MS-DOS, CP/M.
149-The Baylor PC Users Group (BPCUG), c/o Baylor University, P.O. Box 585, Waco, TX 76798. 817-755-3311 E 6853 Supporting MS-DOS.

UT 801

885-Ogden TI-99/4A Users Group, c/o Mr. James Buck, 1005 S. 1000 W., Clearfield, UT 84015. 801-773-2552 Supporting TI99/4A, Geneve.
FOG A.M.O. 105--Salt Lake Metropolitan O Group (SMOG), c/o William Adams, 760 - 3 Fountains Drive #106, Murray, UT 84107. 801-526-2280 Supporting CP/M, MS-DOS.
733-Payson Area Commodore User Group (PAC), P. O. Box 525, Salem, UT 84653. Supporting Commodore.
106-Utah Computer Association, 5637 Bree Street, Salt Lake City, UT 84118. 801-966-6782 Supporting all systems.
227-Salt Lake and Valley 99er User Grp (SLaVe), 3818 W. 6540 So., West Jordon, UT 84084. 801-295-8279 Supporting TI99/4A.

VA 703

1125-National Capital Amiga User Group (NCAUG), P.O. Box 12360, Arlington, VA 22209. 703-532-1642 Supporting Amiga.
575-Northern Virginia Apple Users Grou (NOVAPPLE), c/o Dave Harvey, P. O. Box 8211, Falls Church, VA 22041. 301-899-4005 Supporting Apple, Macintosh.
107-The NOVA Osborne Users Group (NOVA OUG), c/o William E. Kost, 7007 Brocton Court, Springfield, VA 22150. 703-560-5117 Supporting CP/M, MS-DOS.

VA 804

551-Apple Users Group International (ATGI), c/o H. Joseph Dobrowolski, P. O. Box 913, Langley AFB, VA 23665. 804-865-7520 Supporting Apple, Macintosh.
935-Portsmouth Commodore Users Group (PCUG), P. O. Box 6561, Portsmouth, VA 23703. 804-393-4799 Supporting Commodore.
FOG A.M.O. 52--Central Virgina O G (CVOG), c/o Theodore B. Smith, 9206 Mapleway Road, Richmond, VA 23229. 804-740-5718 Supporting CP/M, MS-DOS.
619-Richmond Kaypro Users Group (RKUG), c/o Wayne Anderson, P. O. Box 3892, Richmond, VA 23235. 804-744-6464 Supporting Kaypro, CP/M, MS-DOS.
1132-Commodore Users of Richmond Virgin (CURVE), P.O. Box 28284, Richmond, VA 23228. 804-262-2223 Supporting Commodore.
1096-The VIC-20 Special Interest Group, c/o Bennett Sawey, 308 Merritt St, South Boston, VA 24592. Supporting Vic20.
1099-Halifax Users Group (HUG), c/o Bennett Sawey, 308 Merritt St, South Boston, VA 24592. Supporting MS-DOS.
FOG A.M.O. 78--Tidewater Osborne Group (TOG), c/o William B. Stilley, P.O. Box 68068, Virginia Beach, VA 23455. 804-497-5556 Supporting CP/M, MS-DOS.
27-Commodore-Amiga Online Users Group, c/o John R. Williams, P.O. Box 62,645, Virginia Beach, VA 23462. 804-671-7547 Supporting Commodore, Amiga.
29-Apple IIe/IIgs Online Users Group, c/o John R. Williams, P.O. Box 62,645, Virginia Beach, VA 23462. 804-671-7547 Supporting Apple.
33-C64/C128 Online Users Group, c/o John R. Williams, P.O. Box 62,645, Virginia Beach, VA 23462. 804-671-7547 Supporting Commodore.
61-IBM PC & Compatible Online Users G, c/o John R.Williams, P.O. Box 62,645, Virginia Beach, VA 23462. 804-671-7547 Supporting MS-DOS.
934-Southside Tidewater Atari Technica (STATUS), 5425 Shenstone Circle, Virginia Beach, VA 23455. 804-464-2100 Supporting Atari, AtariST.

VI 809

FOG A.M.O. 70--St. Croix Osborne Users Group (ST. COUG), c/o Photo-Ready Printing Inc., P. O. Box 2610 - Christiansted, St. Croix, VI 00820. 809-778-6651 Supporting CP/M.

VT 802

60-VNHOG Computer Group (VNHOG), c/o Penquin Peripherals, 5 Hillcrest Road, Rutland, VE 05701-2528. 617-524-4834 Supporting Osborne.

WA 206

607-Computer Literacy Users Bureau (CLUB), 1075 Bellevue Way NE Suite 146, Bellevue, WA 98004. Supporting Sanyo, MS-DOS.
597-Kitsap Country Atari Comp Entusias (KCACE), c/o Kitsap County ATARI Enthusiast, POB 2333, Bremerton, WA 98310. 206-373-4840 Supporting Atari, AtariST.
41-Puget Sound 99ers (TIPS 99), P.O.Box 66073, Lynnwood, WA 98036. 206-745-3249 Supporting TI99/4A, Geneve 9640.
186-Seattle Clipper User Group, P.O. Box 5094, Lynwood, WA 98046. 206-481-1978 Supporting Clipper.
1130-Island Commodore Users Group (I.C.U.G.), P.O. Box 1471, Oak Harbor, WA 98277.
FOG A.M.O. 112--Osborne Executive User's Group (OEUG), P. O. Box 12214, Seattle, WA 98102. 206-232-2763 Supporting CP/M, CPM+.
263-Starbase - An Official Atari U.G., c/o Steve Drake, 8307 27th NW, Seattle, WA 98117. 206-782-3691 Supporting Atari.
264-Telecommunications Users Group (TUG), P.O. Box 45254, Seattle, WA 98145-0254.

206-788-5081 Supporting telecommunications.
FOG A.M.O. 72--Tacoma Open Group for microcompute (TOG), c/o Robert J. Thomson, 1808 Lenore Drive, Tacoma, WA 98406. 206-752-5582 Supporting CP/M, MS-DOS.
890-Tacoma Area PC Users Group (TAPCUG), c/o Lew Chichester, 2811 Bridgeport Way West #24, Tacoma, WA 98466. 206-565-4917 Supporting MS-DOS.
1089-Univ. Place Commodore Users Group (UPCHUG), P.O. Box 11191, Tacoma, WA 98411. 206-474-4683 Supporting Commodore.
265-Vashon Island Sinclair-Timex Assoc (VISTA), c/o Tony Willing, P.O. Box 199, Vashon Island, WA 98070. Supporting Timex Sinclair.

WA 509

FOG A.M.O. 123--Spokane Microcomputer Users Group (SMUG), c/o Rings & Things, P. O. Box 1753, Spokane, WA 99210-1753. 509-922-1346 Supporting all systems.
FOG A.M.O. 19--Three Rivers Osborne Group (WA) (TROG, WA.), c/o Allen B. Webb, 743 North 61st Avenue, West Richland, WA 99352. 509-967-2430 Supporting CP/M.

WI 414

FOG A.M.O. 22--Combined Microcomputer Owners Soc. (C.M.O.S.), c/o Robert W. Price, 2255 North 166th Street, Brookfield, WI 53005. 414-782-4377 Supporting CP/M, MS-DOS.

WI 608

224-Madison Area Commodore Users Group (MACUG), P.O. Box 1305, Madison, WI 53701-1305. 608-831-6995 Supporting Commodre, CP/M.
1302-Madison Wisconsin PC Users Group, P.O. Box 5103, Madison, WI 53705. Supporting MS-DOS.

WI 715

936-Price County Computer Users Group (PCCUG), c/o Joseph A. Huycke, Route 1, Box 164, Prentice, WI 54556. 715-428-2335 Supporting Commodore, Apple, MS-DOS.
11-Wausau Area Computer Users Group (WACUG), P. O. Box 186, Wausau, WI 54401.

WV 304

FOG A.M.O. 59--Kanawha Valley FOG (Valley FOG), c/o Merritt Corp., P.O. Box 668, Charleston, WV 25323-0668. 304-344-3638 Supporting CP/M, MS-DOS.
709-Personal Computer -- Huntington U (PCHUG), c/o Levi Lauvray, P. O. Box 2173, Huntington, WV 25722-2173. 304-526-5189 Supporting all systems.
946-Beckley Area Microcomputer Users G (BAMUG), c/o Robert Painter, Rt. 1, Box 116, Mt. Hope, WV 25880. 304-877-6740 Supporting MS-DOS, Tandy, Commodore, CoCo.

WY 307

824-Big Horn Basin Computer User's Grp (BHBCUG), c/o Paul Card, 1532 19 St, Cody, WY 82414. Supporting MS-DOS, Apple, Commodore.

Canada

Alta403

FOG A.M.O. 94--Calgary Osborne Users Group (COUG), c/o Sidney Lee, #2 - 3135 41st Street S.W., Calgary, ALTA T3E 3K9, CANADA. 403-246-2030 Supporting CP/M, MS-DOS.
FOG A.M.O. 45--Klondike Osborne Group (KOG), c/o Richard Guthrie, P.O. Box 4974 Stn PSSE, Edmonton, ALTA T6E 5G8, CANADA. 403-426-0819 Supporting CP/M, MS-DOS.
1030-Edmonton Adam Users Group (EAUG), c/o Ken Gerhardt, 73, 52311 Range Rd 223, Sherwood Park, ALTA T8C 1A9, CANADA. 403-458-7801 Supporting Adam.

B.C.604

555-Apples Brit Col Computer Society, c/o David James, P. O. Box 80569, Burnaby, B.C. v5h 3x9, CANADA. 604-291-1005 Supporting Apple.
192-Vancouver Clipper Developers Assoc, 20132 27 Ave, Langley, B.C. V3A 4P5, CANADA. 604-530-0215 Supporting Clipper.
115-The New 99er Users' Group CO-OP, 216 10 Ave, New Westminster, B.C. V3L 2B2, CANADA. 604-430-3446 Supporting TI99/4A.
FOG A.M.O. 17--Vancouver Portable Computer Club (VPCC), c/o Jay H. Siegel, 4251 Lancelot Drive, Richmond, B.C. V7C 4S4, CANADA. 604-271-1519 Supporting CP/M, MS-DOS.
976-Chilliwack Commodore Computer Club (C.C.C.C.), P. O.Box 413, Sardis, B.C. V2R 1A7, CANADA. Supporting Amiga, Commodore.
1290-International PC-Lotto Club, 870 Gladiola Ave, Victoria, B.C. V8Z 2T6, CANADA. 604-479-8536 Supporting MS-DOS.

Mani204

24-Muddy Waters User Group (MWUG), 55 Rowand Ave, Winnipeg, MANI R3K 2N6, CANADA. 204-832-3982 Supporting CP/M, MS-DOS.
191-Winnipeg Clipper User Group, 23 Peony, Winnipeg, MAN. R, CANADA. 204-338-1818 Supporting Clipper.

N.S.902

931-Sydney Amateur Radio Club Comp UG (SARCCUG), c/o Wm. Dean Milner, P. O. Box 584, Sydney, NS B1P 6H4, CANADA. Supporting MS-DOS, Commodore, Apple, CP/M, TI99/4.

ONT 416

1297-Metro Toronto ADAM Group (MTAG), P.O. Box 165, 260 Adelaide St. E, Toronto, ONT M5A 1N0, CANADA. 416-783-0316 Supporting Adam.

Ont.416

1303-North America Modem User's Group, c/o Mike Klein, Box 159, Cobourg, ONT. K9A 4K6, CANADA. 416-675-1187 Supporting Commodore, telecommunications.
1218-Christian Computer Users Group, c/o Leonard Terry, 1 Westcott St, London, ONT N6C 3G6, CANADA. Supporting MS-DOS, church applications.
430-Toronto Timex-Sinclair Users Group (TTSUC), c/o George Chambers, 14 Richome Court, Scarborough, ONT. M1K 2Y1, CANADA. Supporting Timex Sinclair.
6-Metro Toronto ADAM Group (MTAG), Box 165, 260 Adelaide St., Toronto, ONT. M5A 1N0, CANADA. 416-783-0316 Supporting Adam, CP/M.
602-9T9 Users Group (9T9 UG), c/o Randy Rossetto, #109-2356 Gerrard Street East, Toronto, ONT. M4E 2E2, CANADA. 416-469-3468 Supporting TI99/4A.
910-Sanyo Users in Toronto (SUIT), P.O. Box 6206, Station -A-, Toronto, ONTARIO M5W 1P6, CANADA. 416-967-1455 Supporting Sanyo, MS-DOS.
1127-Toronto PET User's Group (TPUG), 5300 Yonge St., Toronto, ONTARIO M2N 5R2, CANADA. 416-733-2933 Supporting all Commodores.
FOG A.M.O. 120--Osborne/Kaypro User Club of Toront (O/KUCT), c/o Leslie F. Fontaine, 4 Munhall Road, Weston, ONT. M9P 1P9, CANADA. 416-247-8503 Supporting CP/M, MS-DOS.

Ont.519

FOG A.M.O. 95--London Osborne Group (LOG), c/o Jack Lorimer, 1625 Hillside Drive, London, ONT. N6G 2R1, CANADA. Supporting CP/M, MS-DOS.
1106-Hyperion Users Group, c/o Leonard Terry, 1 Westcott St, London, ONT N6C 3G6, CANADA. Supporting Hyperion, MS-DOS.
142-Windsor-Essex T.I. Users Group (WESTIG), 2920 St. Patrick's, Windsor, ONT N9E 3G7, CANADA. 519-966-6977 Supporting TI99/4A.

Ont.705

431-Sudbury 99ers, c/o Jim McLaren, Site 1 Box 7, Whitefish, ONT. P0M 3E0, CANADA. 705-522-5665 Supporting TI99/4A.

P.Q.514

FOG A.M.O. 73--Montreal Micro Computer Society (MICROCOZM), c/o Gerald Barry, Suite 2100, 1080 Beaver Hall Hill, Montreal, P.Q. H2Z 1S8, CANADA. 514-526-9940 Supporting CP/M, MS-DOS.
897-Spectravideo and MSX User's Group (SMUG), c/o Frances Fontaine, 20 - 159th Avenue, N.D. Ile Perrot, P.Q. J7V 5V6, CANADA. 514-453-0477 Supporting Spectravideo MSX, MS-DOS, CP/M, Amiga.

P.Q.819

1131-Association de l'info de l'estrie, P.O. Box 1627, Sherwood, P.Q. J1H 5M4, CANADA. Supporting Commodore.

Australia

156-Adelaide Texas Instr Computer Club (ATICC), c/o Fred Cugley, 26 Suffolk Ave, Brahma Lodge 5109, SOUTH AUSTRALIA, AUSTRALIA. 08-258-3499 Supporting TI99/4A, Geneve 9640.
59-Univ of Queensland Osborne Group (UQOUC), c/o Commerce Dept.-U of Queensland, St Lucia, Brisbane, QUEENSLAND 4067, AUSTRALIA. 07-371-4294 Supporting CP/M.
FOG A.M.O. 131--Victorian Osborne Users Group (VOUG), P. O. Box 169, Camberwell, VIC 3124, AUSTRALIA. (03) 459-8934 Supporting CP/M, MS-DOS.
187-Sydney Clipper User Group, c/o Aeronaut Industries Pvt Ltd., 49 Cairo St, Cammeray, NSW 2062, AUSTRALIA. 02-923-2857 Supporting Clipper.
1029-Brisbane Users' Group for 16-bit (BRISBUG), P. O. Box 985, Toowong, QLD. 4066, AUSTRALIA. 831-8311 Supporting 16-bit.

Denmark

1056-Randers Computer Club (RCC), Udbyhajvej 150, Randers DK-8900, DENMARK. Supporting CP/M, Commodore, Amstrad.

England

74-B O O G Ltd (BOOG), c/o Barrie J. Towey, 42 Warwick Close, Bury, LANCS. BL8 1RT, ENGLAND. 061-705-1031 Supporting Osborne.
1167-Independent Commodore Product Us G, c/o Jack B. Cohen, 30, Brancaster Rd Newbury Park, Ilford, ESSEX IG2 7EP, ENGLAND. 44-346-0050 Supporting Commodore.

Finland

76-Suomen Kaypro User's Group (SUOKUG), c/o HI-FI LTD., Villa Remedia, SF-16100 Uusikyla, FINLAND. 3-58-14-63-11-36 Supporting Kaypro.

France

FOG A.M.O. 110--Osborne Users FRANCE (OUF), FRANCE. 43-44-82-65 Supporting CP/M.

Greece

967-Cretan Apple User Group, c/o Michael Heretakis, 7 Palmeti Str., 71202 Heraclion, CRETE, GREECE. Supporting Apple.

Hungary

678-John vonNeuman Society for Comp Sc (HCC), P. O. Box 240, H-1263 Budapest, HUNGARY. Supporting all systems.

Indonesia

739-Jakarta Computer Society (JCS), c/o James Filgo, P.O. Box 190/KBYB, Jakarta 12001, INDONESIA. 62- 21- 76- 7832 Supporting MS-DOS.

Israel

FOG A.M.O. 33--Israel Osborne Users Group (IOUG), c/o, ISRAEL. 0-523-4043 Supporting CP/M.

Liechtentstein

92-Amiga User Group Liechtentstein (AUGL), Box 660, FL-9490, Vaduz, LIECHTENSTEIN. 0041 75 2 03 33 Supporting Amiga.

New Zealand

FOG A.M.O. 53--New Zealand Osborne Group (NZOG), c/o 8 Titoki Avenue, Mangere Bridge, Auckland, NEW ZEALAND. 09 88-7135 Supporting CP/M, MS-DOS.
FOG A.M.O. 109--Central Region Osborne Group (CROG), P. O. Box 6571, Te Aro, Wellington, NEW ZEALAND. 64 04 852555 Supporting CP/M, MS-DOS.

South Africa

FOG A.M.O. 90--Johannesburg Osborne Group (JOG), Box 33360, Jeppestown 2043, SOUTH AFRICA. 011-51-6304 Supporting CP/M.

Thailand

45-Bangkok Computer Users Group (BUG), P.O. Box 11-213, Bangkok 10110, THAILAND. 622-279-6186 Supporting CP/M, MS-DOS.

West Germany

FOG A.M.O. 36--Computer Club Deutschland (CCD), c/o Werner Dworak, Allewind 51, 7900 Ulm, WEST GERMANY. 07-304-3274 Supporting CP/M, MS-DOS.
FOG A.M.O. 24--American German O G (AGOG), c/o Amccom, 4th Bde, APO, NY 09185-2216. 061-52-4210 Supporting CP/M, MS-DOS.
740-The Amiga Connection of Europe (ACE), c/o Scott Powers, 56th Aviation Company, APO, NY 09028. 06206-79514 Supporting Amiga.
FOG A.M.O. 103--Eifel Fog Users Group (EFOG), Box 686, APO NY 09132-5362. Supporting CP/M, MS-DOS.
FOG A.M.O. 62--First Ramstein O G (FROG), c/o USAFE/DEW, Box 2732, APO New York, NY 09021-5369. (0049) 6301-4150 Supporting CP/M, MS-DOS.
1124-Commodore Computer Users Group (CCUGH), General Delivery, APO, New York, NY 09102. 06224-12408 Supporting Commodore, Amiga.

Special Interest Groups

FOG A.M.O. 85--Microcomp. In Sup. Of Trans. (MIST), c/o Wycliffe Bible Translators, P.O. Box 188, Eastlake, CO 80614. 303-450-9608 Supporting CP/M.
FOG A.M.O. 96--ERC-Osborne Users Group (ERC-OUG), c/o A. W. Adkins Jr., 10418 44th Avenue, Beltsville, MD 20705. 301-937-7954 Supporting CP/M.
12-Dvorak Developments, P. O. Box 1895, Upland, CA 91785. Supporting Dvorak keyboard.
14-International Blind Users Group (I-BUG), P.O. Box 1352, Roseville, CA 95661-1352. 916-783-0364 Supporting All systems.
22-The C Users' Group, International (CUG), 2120 W 25 St., Ste B, Lawrence, KS 66046. 316-241-1065 Supporting 'C'.
43-Forth Interest Group (FIG), P. O. Box 8231, San Jose, CA 95155. 408-277-0668 Supporting Forth.
58-COMAL Special Interest Group, c/o Bob Bain, P. O. Box 2689, Silver Spring, MD 20902. 301-649-5964 Supporting Comal.
82-Unify Users Group, c/o Business Resources, 3 Garrett Mtn. Plaza, West Paterson, NJ 07424. 201-523-5000 Supporting Unix.
101-MUMPS Users Group (MUG), 4321 Hartwick Road Suite 510, College Park, MD 20740. 301-779-6555 Supporting MUMPS.
102-Int'l Rainbow Users' Group (IRUG), P.O. Box 567, O Fallon, IL 62269. 618-632-1143 Supporting DEC Rainbow.
173-Tandy 2000 Orphans, c/o David R., 387 Main Street, Westport, CT 06880. Supporting Tandy 2000.
234-DC-BUG, P.O. Box 22233, Eugene, OR 97402. Supporting Commodore.
337-TI PPC Notes, P. O. Box 1421, Largo, FL 34649-1421. Supporting TI-59, TI-74, TI-95.
610-National Epson Users Group (NEUG), P. O. Box 1076, Lemont, PA 16851. 814-237-5511 Supporting Epson.
643-National Televideo Users Group (NTVUG), P. O. Box 22007, San Francisco, CA 94122. 415-753-1552 Supporting Televideo.
670-Friends of LISP/Logo & Kids (FOLLK), P. O. Box 22094, San Francisco, CA 94122. 415-761-4680 Supporting LISP, Logo.
765-Ventura Publisher Users Group (VPUG), c/o Lisa Dolan, 675 Jarvis Drive, Morgan Hill, CA 95037. 408-227-5030 Supporting Ventura Desktop Publishing.
766-WordPerfect User Support Group, P. O. Box 1577, Baltimore, MD 21203. 301-889-7894 Supporting WordPerfect.
905-Amstrad User Group, USA (AUGUST), c/o Harley Ristad, 12741 Matteson Ave 3, Los Angeles, CA 90066. 213-397-7981 Supporting Amstrad PCW.
909-National Visual Commuter Users Grp, c/o Patric Lee Howley, 454 Barcelona Drive, Satsuma, AL 36572. 205-675-9457 Supporting Visual.
938-ZCPR Users Group, c/o Echelon Inc., P. O. Box 705001-800, South Lake Tahoe, CA 95705. 916-577-1105 Supporting ZCPR, CP/M.
962-Computer-Using Educators (CUE), P. O. Box 271704, Concord, CA 94527-1704. 415-685-7289 Supporting education.
1059-Portable Computer News & Views, c/o Ted Lloyd, P. O. Box 247, Champlain, NY 12919. Supporting portables.
1084-Freedonia Computer Club, c/o Phil Johnson, P.O. Box 2523, Lincoln, NE 68502. Supporting Apple.
1219-Visual 1050 PC Users' Group, c/o George B. Czerw, P.O.Box 502, Rancocas, NJ 08073-0502. 609-261-7204 Supporting Visual 1050.
1221-Ventura Users of North America (VUNA), c/o John Wilson, 1 Heath St. West, Toronto, ONT. M4V 1T2, CANADA. 416-482-3710 Supporting Ventura Publisher.
1223-Micro Managers Association (MMA), 385 Sylvan Ave, Englewood Cliffs, NJ 07632. 201-569-8542 Supporting MS-DOS.
1224-Management of Professional Computi, c/o Lynn Geissler, Shawmut Bank Bo, 1 Federal St., Boston, MA 02211. 617-292-3027 Supporting MS-DOS.
1225-Assoc of Personal Computer Users, 323 S. Franklin St., Suite 204, Chicago, IL 60606. 219-696-6760 Supporting MS-DOS.

Browse The 800 BBS Vineyards Toll-Free!

by Hal Nieburg

Inveterate bulletin board addicts have very large telephone bills, and angry spouses. But there are dozens of toll-free opportunities for traveling the telephone lines of America on your modem supercar, if only you had the numbers. Accordingly, I have tried to compile some of the national BBS 800 numbers and offer a tentative list here which I hope will save bucks and marriages.

So bring up the telephone book of your favorite communications program and begin to enter some of these 100 numbers. Armed with this compendium, a modem can go nationwide freely, with someone else paying the bills. Many happy hours of online browsing are afforded on boards that offer information, forums, various services, and software.

Many of these toll-free boards allow the user to scroll through catalogs of products, and place orders by credit card. Some provide names of local dealers. Some offer user-support for their products online. Some operate as a public service, offering the ordinary features of public boards. In any case, the happy hook upper will find much to fill the wee hours of a Saturday morning, without bloating the telephone bill.

Perhaps, you know of some not on the list—let us know, and we will update the list from time to time.

Toll-Free BBS Numbers Around The Country

Abacus Associates
6565 W. Loop
Bellaire, TX 77401
1-800-547-5995

Access Unlimited
401 N. Central X-Way
Richardson, TX 75080
1-800-527-3475

Advanced Logic Systems
1195 E. Arques Ave.
Sunnyvale, CA 94086
1-800-538-8177

Aerocomp, Inc.
P.O. Box 24829
Dallas, TX 75224
1-800-824-7888

Allenbach Industries
2101 Las Palmas
Carlsbad, CA 92008
1-800-854-1515

Alpha Products
79-04 Jamaica Ave.
Woodhaven, NY 11421
1-800-221-0916

Ammicro
122 East 42nd St.
New York, NY 10168
1-800-251-5110

Applied Microsystems
612 Washington
Denver, CO 80203
1-800-468-4474

Archive
152 Boston Turnpike
Shrewsbury, MA 01545
1-800-343-0314

Atlantic Computer Accessories
6951 N.W. 15th Ave.
Fort Lauderdale, FL 33309
1-800-327-6933

Beagle Bros.
4315 Sierra Vista
San Diego, CA 92103
1-800-854-2003

Beck Mfg.
Box 111 W.
Peterborough, NH 03468
1-800-BECK-MFG

Bottom Line
Milford, NH 03055
1-800-343-0726

B.T. Enterprises
10B Carlough Rd.
Bohemia, NY 11716
1-800-645-1165

Calsoft
346 N. Kanan Rd.
Agoura, CA 91301
1-800-423-5290

C D C
13715 Vanowen St.
Van Nuys, CA 91405
1-800-692-5235

Compaq Computer Corp
12330 Perry Rd.
Houston, TX 77070
1-800-231-9966

CompuAdd Corp.
13010 Research Blvd.
Ste. 101 Austin, TX 78750
1-800-531-5475

Compukit
16206 Hickory Knoll
Houston, TX 77059
1-800-231-6671

CompuSoft
535 Broadway
El Cajon, CA 92021
1-800-854-6505

Computer Applications Unlimited
Box 214
Rye, NY
1-800-354-5400

Computer Discount of America
15 Marshall Hill Rd.
West Milford, NJ 07480
1-800-526-5313

Computer Distribution Assoc.
56 South 3rd St.
Oxford, PA 19363
1-800-523-2909

Computer Exchange
Box 23068
Portland, OR 97005
1-800-547-1289

Computer-Line of Denver
1136 So. Colorado Blvd.
Denver, CO 80222
1-800-525-7877

Computer Mail Order East
477 E. Third St.
Williamsport, PA 17701
1-800-233-8950

Computer Mail Order West
P.O. Box 6689
Sateline, NV 89449
1-800-648-3311

Computer Outlet
1095 E. Twain
Las Vegas, NV 89109
1-800-634-6766

Computer Plus
P.O. Box 926
Littleton, MA 01460
1-800-343-8124

Computer Power Solutions
49th St. North Ste. 203
Pinellas Park, FL 33565
1-800-237-6010

Computer Shack
1691 Eason
Pontiac, MI 48054
1-800-392-8881

Computronics
50 N. Pascack Rd.
Spring Valley, NY 10977
1-800-431-2818

Cosmopolitan Electronics
5700 Plymouth Rd.
Ann Arbor, MI 48105
1-800-393-3785

Creative Computer Center
1236 E. Colonial Dr.
Orlando, FL 32803
1-800-327-9294

Data-assette
56 South 3rd St.
Oxford, PA 19365
1-800-523-2909

Data Dynamics Technology Books
P.O. Box 1234
Cerritos, CA 90701
1-800-423-6665
1-800-423-6666

Data Services, Inc.
P.O. Box 1157
Wichita, KA 67201
1-800-835-1129

Digital Equipment Corp.
200 Baker Ave.
Concord, MA 01742
1-800-DIGITAL

Dilithium Press
P.O. Box E
Beaverton, OR 97075
1-800-547-1842

Discount Software
6520 Selma Ave.
Los Angeles, CA 90028
1-800-421-4003

Diskette Connection
P.O. Box 1674
Bethany, OK 73008
1-800-654-4058

Diskette Junction
5918 Smith Rd.
Cleveland, OH 44142
1-800-321-5134

Duck Co.
1691 Eason
Pontiac, MI 48054
1-800-392-8881

Dynacomp, Inc.
1427 Monroe Ave.
Rochester, NY 14618
1-800-828-6772

Early Games
Ste. 140 Shelard Plaza N.
Minneapolis, MN 55426
1-800-328-1223

Electronic Protection Devices
5 Central Ave.
Waltham, MA 02154
1-800-343-1813

Electronic Specialists, Inc.
171 South Main St., Box 389
Natick, MA 01760
1-800-225-4876

Epson America
3415 Kashiwa St.
Torrance, CA 90505
1-800-421-5426

Fort Worth Computers
377 Plaza
Granbury, TX 76048
1-800-433-SAVE

Hayden Software
1-800-343-1218

Institute for Scientific Analysis
P.O. Box 7186
Wilmington, DE 19803
1-800-441-7680

Ironsides Computer
18546 Sherman Way
Reseda, CA 91335
1-800-528-9537

Jade Computer Products
4901 West Rosecrans
Hawthorne, CA 90250
1-800-421-5500

Langley-St. Clair Inst. Syst.
132 W. 24th St.
New York, NY 10011
1-800-221-7070

Leading Edge Products
225 Turnpike St.
Canton, MA 02021
1-800-343-6833

Level IV Products
32429 Schoolcraft Rd.
Livonia, MI 48150
1-800-521-3305

Lobo Systems
358 South Fairview Ave.
Goleta, CA 93117
1-800-235-1245

Lyco Computer Marketing & Consultants
P.O. Box 5088
Jersey Shore, PA 17740
1-800-233-8760

MagiComp
2710 W. Country Club Rd.
Philadelphia, PA 19131
1-800-528-9900

Marymac Industries
22511 Katy Fwy.
Katy, TX 77450
1-800-231-3680

Med Systems Software
P.O. Box 3558
Chapel Hill, NC 27514
1-800-334-5470

Memotech Corp.
7550 W. Yale Ave.
Denver, CO 80227
1-800-662-0949

Microcomputer Business Systems
14030 South Springfield Rd.
Brandywine, MD 20613
1-800-638-1857

Microcomputer Games
4517 Harford Rd.
Baltimore, MD 21214
1-800-638-9292

Micro Data Supplies
22295 Euclid Ave.
Euclid, OH 44117
1-800-321-3552

Micro-Design
6301 Manchaca Dr.
Austin, TX 78745
1-800-531-5002

Micro-Ed
P.O. Box 444005
Eden Prairie, MN 55344
1-800-MICRO-ED

Micro Images Industries
164-06 Crocheron Ave.
Flushing, NY 11358
1-800-223-1182

Micro Management Systems
2803 Thomasville Rd.
Cairo, GA 31728
1-800-841-0860

Micromint Inc.
561 Willow Ave.
Cedarhurst, NY 11516
1-800-645-3479

Micro Merchant
290 North 10th St.
Colton, CA 92324
1-800-652-8391

Micro-Systems Software
18 Oak Circle
Boca Raton, Fl 33431
1-800-327-8724

Microtek, Inc.
9514 Chesapeake Dr.
San Diego, CA 92123
1-800-854-1081

Montezuma Micro
P.O. Box 2169
Camp Verde, AZ 86322
1-800-442-1310
1-800-527-0347

National Computer Products
8338 Center Dr.
La Mesa, CA 92041
1-800-854-6654

Nebs Computer Forms
12 South St.
Townsend, MA 01469
1-800-225-9550

Nonagon Software
P.O. Box 1486
El Cerrito, CA 94530
1-800-942-2058

Okidata
Mt. Laurel, NJ 08054
1-800-OKIDATA

Omega International
334 Cambridge St.
Burlington, MA 01803
1-800-343-0873

Pacific Exchanges
100 Foothill Blvd.
San Luis Obispo, CA 93401
1-800-235-4137

Pan American Electronics
1117 Conway Ave.
Mission, TX 78572
1-800-531-7466

Penguin Products
P.O. Box 7008
Roseville, MI 48305
1-800-732-0641

Percom Data Inc.
1-800-527-1222

Perry Oil & Gas Inc.
137 N. Main St.
Perry, MI 48872
1-800-248-3823

Pickam Software
312 S. Los Angeles St.
Los Angeles, CA 90013
1-800-858-4848

Powersoft
11500 Stemmons Fwy.
Dallas, TX 75229
1-800-527-7432

Producer Software
P.O. Box 1327
Arlington, TX 76004
1-800-433-5184

Programmer's Institute
P.O. Box 3470
Chapel Hill, NC 27514
1-800-334-SOFT

eProSoft
Box 560
No. Hollywood, CA 91603
1-800-824-7888

Qantex Division of North Atlantic
60 Plant Ave.
Hauppauge, NY 1788
1-800-645-5292

Ralston Clearwaters Electronics
536 N.E. "E" St.
Grants Pass, OR 97526
1-800-547-2492

Red Baron Computer Products
4501 E. Eisenhower Circle
Anaheim, CA 92807
1-800-854-8275

Sams Books
4300 W. 62nd St. P.O. Box 7092
Indianapolis, IN 46206
1-800-428-3696

Simutek
4897 E. Speedway
Tucson, AZ 85712
1-800-528-1149

Software Support
1 Edgell Rd.
Framingham, MA 01701
1-800-343-8841

Sunlock Systems
4217 Carolina Ave.
Richmond, VA 23222
1-800-368-9191

Networking
continued from page 502

blocks. Ymodem also uses 1024 byte blocks, but transfers the file name and size so that the receiver can name the file without user input. Ymodem also features batch protocol, which means you can enter up to 20 file names or numbers and have them downloaded all at one time, without having to name the files or with any other input at all. Details online, or check with your favorite RT Sysop.

GEnieMall Debuts

GEnie has opened an all-new shopping service that features nationally-known vendors and more than a few unique product lines. Users can browse the mall, shop by category, or use the "Mall Product Finder" to locate specific products.

Among the many vendors are Coffee Emporium, Legal Sea Foods, 800 SPIRITS, MaryMac Industries (the nation's largest discounter of Tandy hardware), Software Discounters of America, Apparel Concepts, Crutchfield's, Computer Express, and Godiva Chocolates.

CB Club Offers Flat Monthly Fee

For a flat monthly fee of $50.00 per month, you can enjoy unlimited non-prime usage of GEnie's CB Simulator. The club offers a number of offline benefits, too (such as discounts at Disney World's EPCOT Center). Membership can be cancelled at any time. For more information, type CB, and select the appropriate option.

People Link (PLINK) Tymnet Access Discontinued

As of mid-July, PLINK was no longer accessible via Tymnet. PLINK management decided to discontinue Tymnet usage due to low Tymnet usage and "excess packet surcharging." According to Elizabeth McGuinness of PLINK, their service was faced with a choice of raising prices or discontinuing one of the networks.

PLINK is still accessible via Telenet, Telenet's PC Pursuit service, and direct-dial, with no change in rates.

The Source New Investors' Service

The Source has added RateGram, a biweekly newsletter that provides information on the nation's highest federally-insured yields from banks and S&Ls, and the highest-yield money market funds. Categories tracked include several varieties of CDs (six-month, one-year, two-and-a-half-year, five-year CDs, as well as 90-day and six-month jumbo CDs), liquid money market deposit accounts (MMDA), and taxable and tax-exempt money market funds. Contact information is provided for investments listed.

Charges are $1.00 per minute during non-prime time, and $1.50 per minute prime-time. Type RATEGRAM at Command Level for access.

UNISON Baseball Online Now Available On UNISON

UNISON now offers access to Rotisserie and Fantasy League Baseball through Baseball Online, the newsletter for Rotisserie players and baseball fans.

Baseball Online provides an online source of information, strategy, opinions, and conversation from the point of view of a Rotis or Fantasy player. Written by a staff of championship Rotis players, Baseball Online is updated at least twice a week with articles on all aspects of the Rotisserie world. Some of the departments in Baseball Online are:

* Rotis Alert—Players of note, special developments.
* Player Evaluations—Analysis and ratings of players.
* Rotis Strategy—Discussions of game strategies.
* Features—Articles from experts and guest columnists.
* Baseball Forum—Lively interactive discussions.
* Just for Fun—Baseball is really a very funny game.
* What to Read—Reviews of books and periodicals.

Epson FX Series Printers

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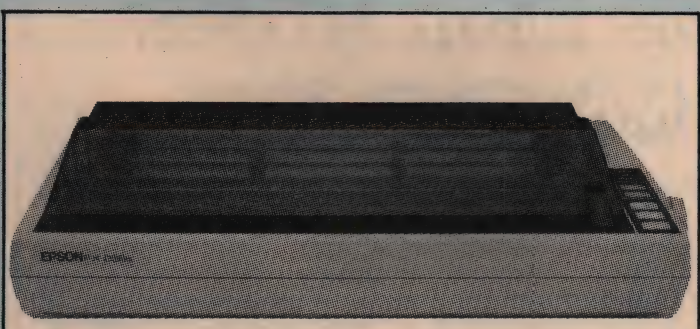


Retail $799

Increase Your Office Productivity . . .

Epson FX-286e

$CALL & AVE

Epson continues to set the pace in printer performance with the FX-286e. Its 240 CPS print speed is fast enough to handle any size job with efficiency and ease. It will print a typical business letter in approximately 20 seconds. You'll value the speed and versatility of this hard-working Epson printer.

- 240 CPS Draft/48 CPS NLQ
- 15", 138 Column Wide Carriage
- Both Epson & IBM Compatible
- Built-In Tractor Feed
- Standard Parallel Interface
- Large 8K Print Buffer
- Easy SelecType Front Panel
- High Resolution Graphics
- Automatic Single Sheet Load
- Double High Characters
- Original +2 Copy Capacity
- One Year Manufacturer's Warranty

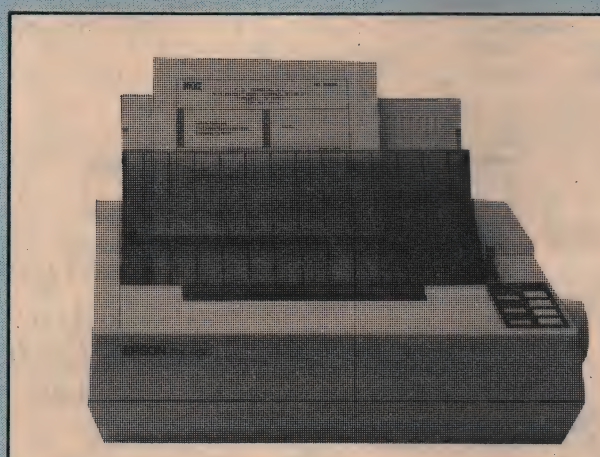
264 CPS & SmartPark™

Epson FX-850

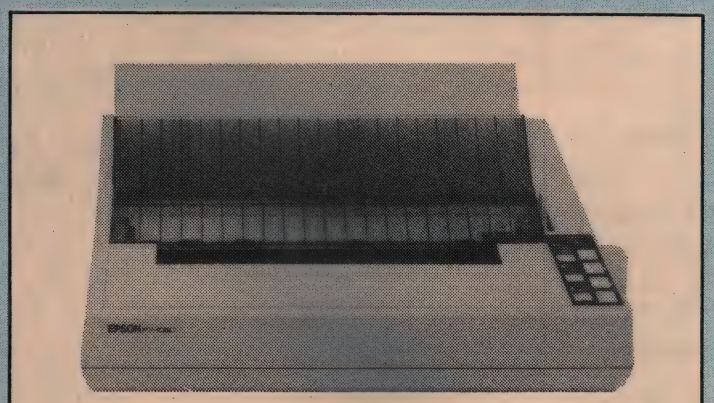
$CALL & AVE

The NEW Epson FX-850 combines advanced paper-handling capabilities, high speed productivity and SelecType front panel control. The unique SmartPark™ feature lets you switch paper formats without removing hardware or paper. SmartPark™ includes auto paper parking, micro adjustment for top-of-form setting and short-form tear-off positions.

- Fast 264 CPS Draft/54 CPS NLQ
- 80 Column, 10" Carriage
- Both IBM & Epson Compatible
- Unique SmartPark™ Feature
- Standard Push Tractor Feed
- Standard Parallel Interface
- Generous 8K Print Buffer
- High Resolution Graphics
- Automatic Single Sheet Load
- Built-In Draft, Roman, Sans Serif Fonts
- Original +3 Copy Capacity
- One Year Manufacturer's Warranty



Retail $549



Retail $799

15" Wide Carriage & SmartPark™

Epson FX-1050

$CALL & AVE

The Epson FX-1050 is just right for your small business or office workstation. Its wide 15", 136 column paper carriage easily handles spreadsheets, graphs and data processing jobs. The FX-1050 also has Epson's unique SmartPark™ feature for versatile paper handling capability. It's a hard working, reliable printer.

- Fast 264 CPS Draft/54 CPS NLQ
- 136 Column, 15" Carriage
- Both IBM & Epson Compatible
- Unique SmartPark™ Feature
- Standard Push Tractor Feed
- Standard Parallel Interface
- Generous 8K Print Buffer
- High Resolution Graphics
- Automatic Single Sheet Load
- Built-In Draft, Roman, Sans Serif Fonts
- Original +3 Copy Capacity
- One Year Manufacturer's Warranty

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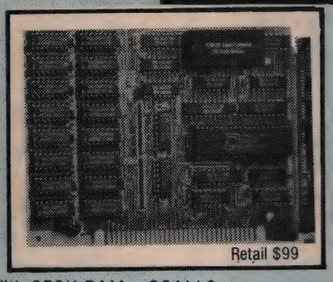
Tandy is Dandy . . . until you want MORE!

More Memory


Retail $99

Tandy 1000 RAM Card

The Zuckerboard Expansion Memory Board is an inexpensive way to expand the memory on your Tandy 1000 to its total capacity of 640K. Enjoy greater software flexibility with a more powerful memory system.

With 0K **$59**

With 256K RAM – $CALL$
With 512K RAM – $CALL$

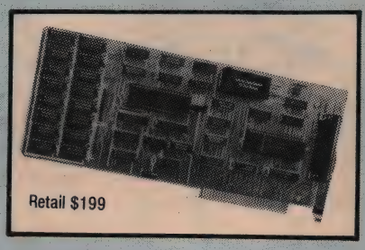
- Full Tandy 1000 Compatibility
- Brings System To Full 640K
- DMA Controller On Board
- Low Power Consumption
- Half Card Size
- Easy Installation. Just Plug and Play
- Optional Clock/Calendar With 20-Year Battery
- Two Year Warranty

Optional Clock/Calendar – $39

More Functions

Tandy 1000 Multifunction Card

Now you can get more functions on one board with Zuckerboard's Multifunction Board. It gives you expanded memory up to 640K, RS-232 serial port and a 20-year clock/calendar. No other board does so much in so little space.

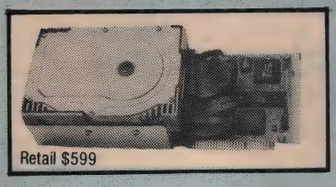

Retail $199

With 0K **$139**

With 256K RAM – $CALL$
With 512K RAM – $CALL$

- Full Tandy 1000 Compatible
- Brings System To Full 640K
- DMA Controller On Board
- Standard Com1, Com2 Serial RS-232 Port
- RAM Disk, Print Spooler Software
- Clock/Calendar With 20 Year Battery
- Two Year Warranty

More Storage


Retail $599

Tandy 1000 30Mb Hard Drive Card

The Zuckerboard 30 megabyte Hard Disk Card gives you maximum data storage. Eliminate the accumulation of all those floppy diskettes and dramatically decrease the load time on larger files.

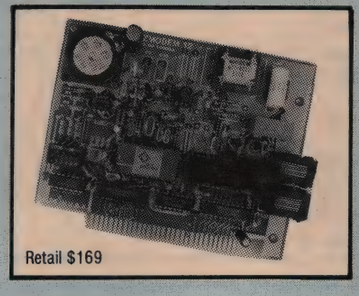
$~~429~~
Even Less

- Full Tandy 1000, Tandy SX & Tandy 3000 Compatible
- 30 Mb of Data Storage
- Preformatted
- Low Power Consumption
- Fast 66 ms Access Time
- Comes Completely Assembled
- No Preventive Maintenance Required
- Made In U.S.A. & Comes With One Full Year Warranty

More Communication

Tandy 1000 1200 Baud Internal Modem

Open up whole new worlds of information with the Tandy compatible 1200 baud internal modem. It fits and works perfectly for all your communications needs from bulletin board access to transmitting and receiving important data.


Retail $169

Your Price **$~~89~~**
Even Less

- Fully Hayes Compatible
- Pulse/Tone Dialing
- Complete With Software
- Auto Dial/Auto Answer
- Two Telephone Jacks
- Speaker For Volume Admustment & Line Monitoring
- 1200 Baud Transmission Rate
- Five Year Warranty

Attention Tandy SX, TX and 1200 Owners . . .
The following Zucker IBM cards are compatible with your Tandy computer . . .

Color Graphics Half Card	69	RAM Half Card With 384K	$CALL$
RAM Half Card With 0K	49	RAM Half Card With 512K	$CALL$

4-Port I/O Card (Parallel/Serial/Clock - 2nd Serial Optional) 99

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ZOOM 2400 Baud Modems

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Dear Loyal Customer,

Now you can have a fast 2400 baud, fully Hayes compatible modem at a breakthrough price. Zoom Telephonics, Inc. uses the latest version of the Texas Instruments 2400 baud chip set for both the PC 2400 HC internal modem and MX 2400 external modem. You get the benefit of this latest technological breakthrough at a price you can afford.

The advanced features of ZOOM's 2400 baud internal or external modem include full Hayes compatibility, monitor speaker with volume control and fast 2400 baud transmission rate to save you time and money. You can connect to The Source, Dow Jones, NewsNet and other leading data bases plus transmit and receive important business files and time sensitive reports. The MX 2400 external modem's compact size makes it the perfect traveling companion for your laptop or portable computer. And of course all ZOOM modems are made in the U.S.A. and are backed by a two year warranty.

For clear, fast transmission of your valuable data choose the ZOOM PC 2400 HC internal modem or MX 2400 external modem. These high quality modems are triple tested to exacting standards. Call MidWest Micro today and ask for the ZOOM PC 2400 HC internal modem or MX 2400 external modem. You can buy with confidence from MidWest Micro. We offer not only the best prices but also fastest delivery in the industry and beat after-the-sale support possible.

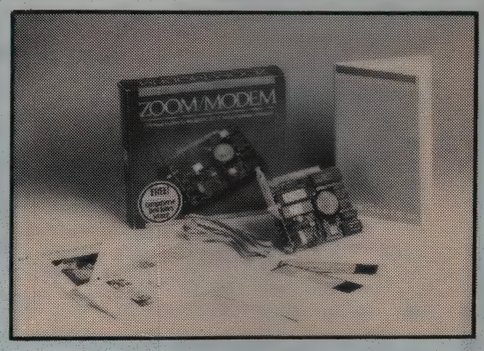
Sincerely,

Mark Runkle

Mark L. Runkle
President

Technologically Advanced, Hayes Compatible . . .

ZOOM PC 2400 HC Internal Modem



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Your Price
$149
Even Less
Qty. 3+ $CALL$

The ZOOM Modem PC 2400 HC is packed with features that many competitors don't have like on-board speaker with volume control and support of 4 COM ports instead of two. It has all the performance and Hayes compatibility you'll need at a breakthru price for 2400 baud.

- Fully Hayes Compatible
- 2400/1200/300 Baud Transmission Rate
- Compatible With IBM PC, XT, AT and Compatibles
- Complete With ProComm Software
- Auto Dial/Auto Answer
- Monitor Speaker With Volume Control
- Addressable COM 1,2,3,4
- Full Duplex Operation
- Two Year Manufacturer's Warranty

Retail $199

ZOOM MX 2400 External Modem

Your Price
$159
Even Less
Qty. 3+ $CALL$

The ZOOM Modem MX 2400 puts a lot of performance into a compact, attractive package, it's not much larger than a paperback book. That makes the MX the perfect modem for your laptop or portable computer, the perfect modem for travel, and the perfect modem for anyone who doesn't want to take up extra desk space.

- Fully Hayes Compatible
- 2400/1200/300 Baud Transmission Rate
- Compatible With IBM PC, XT, AT and Compatibles
- Complete With Communications Software
- Monitor Speaker With Volume Control
- Auto Dial/Auto Answer
- 8 Status Indicator Lights
- Lightning Protection
- Second Jack for Local Phone
- Full Duplex Operation
- Two Year Manufacturer's Warranty

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Phone (513) 368-2309

Dear Computer User,

Star's SR-10 and SR-15 printers are high speed business printers that work as fast as you do. The 200 cps print speed and high quality output will keep your work flow at peak performance. You can print correspondence, reports, graphic presentations and spreadsheets quickly and easily. When your turn-around time is short and volume level high, Star's SR-10 or wide carriage SR-15 printer is a perfect solution.

We are pleased to offer these sophisticated, high-speed printers at a price that won't break the bank! Now you can have a 200 cps, full-featured printer for much less than you'd normally expect to pay. You'll never pay too much at MidWest Micro. The SR-10 and SR-15 assure exceptional cost efficiency without compromise in quality.

The SR-10 and SR-15 are fully compatible with your IBM PC and compatibles. The tractor feed is built-in for heavy duty use and the printers even have a short-form tear off to accommodate your forms printing needs. They produce high resolution graphics to ensure a great look when you make crucial business presentations.

Give us a call today and put the Star SR-10 and SR-15 to work for you. You'll discover how easy high-speed printing can be.

Sincerely,

Mark Runkle

Mark L. Runkle
President

P.S. – When you need a high-speed, high quality business printer Star's SR printers are a perfect solution.

200 - 240 CPS – High Quality . . .

star micronics SR-10
10", 80 Column

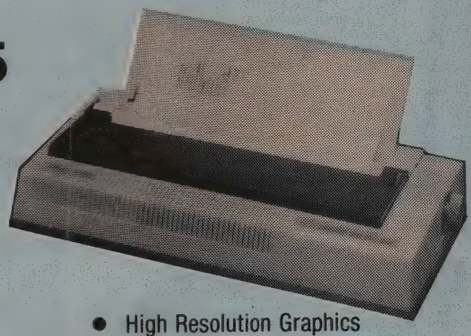
Your Price
$229 *Even Less*

- Fast 200 CPS Draft/ 50 CPS NLQ
- Both Epson & IBM Compatible
- 2K Print Buffer
- Parallel Interface
- Both Friction and Tractor Feeds
- Short Form Tear-Off
- High Resolution Graphics
- Pica, Elite, Condensed, Bold, Double Strike, Underline, Super & Subscripts
- Front Panel Control
- Original +2 Copy Capacity
- One Year Manufacturer's Warranty

Retail $679

star micronics SR-15
15", 136 Column

Your Price
$299 *Even Less*



- Fast 200 CPS Draft/ 50 CPS NLQ
- Both Epson & IBM Compatible
- 16K Print Buffer
- Parallel Interface
- Both Friction and Tractor Feeds
- Short Form Tear-Off
- High Resolution Graphics
- Front Panel Control
- Pica, Elite, Condensed, Bold, Double Strike, Underline, Super & Subscripts
- Original +2 Copy Capacity
- One Year Manufacturer's Warranty

Star "N" Series Printers

		Retail	Sale
NX-10	CPS + NLQ, Epson/IBM Compatible	$349	~~$169~~
NX-10C	Commodore Compatible	349	~~169~~
NX-1000	NEW Multi-Font Selection, 144 CPS, 4K, Paper Parking	299	~~179~~
NX-1000 Rainbow	Prints 7 Colors, Multiple Font Selection, 144 CPS	379	~~249~~
NX-1000C	Commodore Compatible, Multiple Font Selection, 144 CPS	299	~~179~~
NX-1000C Rainbow	Commodore Compatible, Prints 7 Colors, 144 CPS	379	~~249~~
NX-15	120 CPS + NLQ, Epson, IBM Comp., 15" Carriage	529	~~319~~
NR-10	240 CPS, Epson, IBM Comp., 12.6K Print Buffer	579	~~339~~
NR-15	240 CPS, Epson/IBM Comp., 12.6K, 15" Carriage	799	~~439~~
NB24-10	24-Pin, 180 CPS, Epson/IBM Compatible, 8K	749	~~449~~
NB24-15	24-Pin, 180 CPS, Epson/IBM Comp., 15" Carriage	999	~~559~~
NB-15	24-Pin, 300 CPS + LQ, Epson/IBM Comp., 15" Carriage	1399	~~599~~

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Dear Computer User,

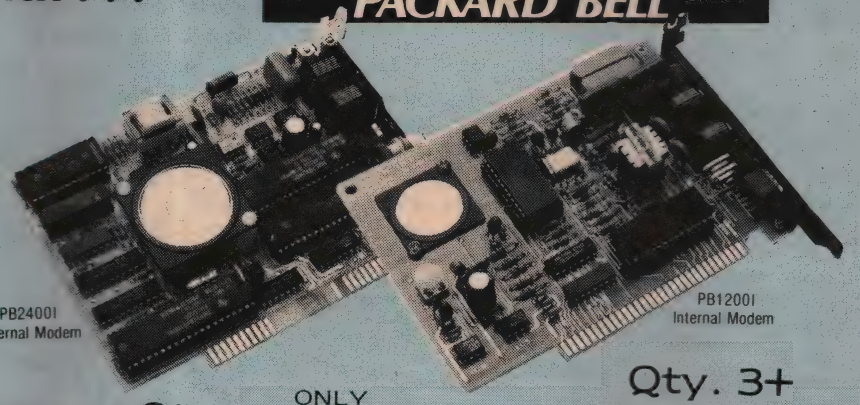
Transmitting data by way of your telephone line is now a daily occurrence. If you want a reliable, trouble-free modem, why not let MidWest Micro furnish you with the best in quality and savings.

We are proud to offer the technologically superior Packard Bell phone modems. Each Packard Bell modem transmits error-free data while providing consistently reliable performance. Packard Bell modems are the result of a 25-year commitment to telecommunications quality and performance. Packard Bell modems are fully Hayes and IBM compatible and carry a two-year warranty. To save you time and money, it's important to transmit accurate information quickly.

Why not discover the value of the time and money saving Packard Bell modems for yourself? Call MidWest Micro today and we'll send you a superior quality phone modem backed by Packard Bell's commitment to quality and MidWest Micro's commitment to fast service and low prices.

Sincerely,
Mark L. Runkle
President

Get Cost Effective, Trouble-Free Data Transmission With . . . PACKARD BELL



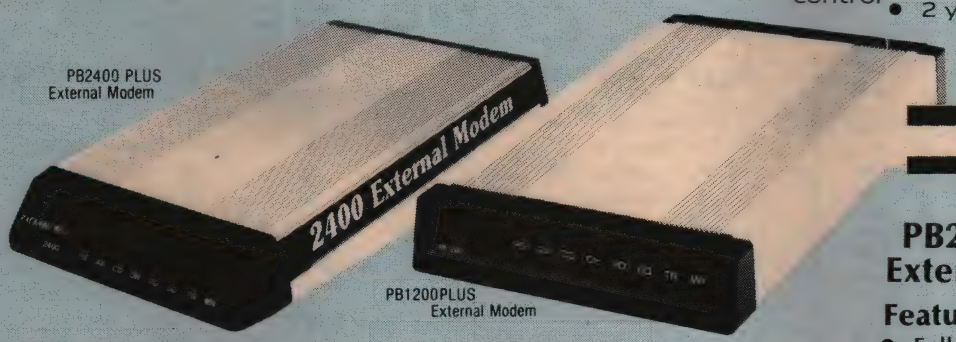
PB2400I Internal Modem
Qty. 3+ ONLY $139 ea. Even Less
Qty. 1+ $149 ea. Even Less

PB1200I Internal Modem
Qty. 3+ $75 ea. Even Less
Qty. 1+ $79 ea. Even Less

Features

PB2400I Internal Modem
- Fully Hayes™ compatible
- ProComm™ included
- Full or half-duplex operation
- PC™/XT™/AT™ compatible
- Auto-dial, auto answer
- Audio output jack
- Audio monitor with volume control
- 2 year warranty

PB1200I Internal Modem
- Fully Hayes™ compatible
- Communication Software and Special Access. Offers included
- Full or half-duplex operation
- PC™/XT™/AT™ compatible
- Auto-dial, auto answer
- Auto tone or pulse dialing
- Audio monitor
- 2 year warranty



PACKARD BELL

PB2400 PLUS External Modem
Qty. 3+ ONLY $159 ea. Even Less
Qty. 1+ $169 ea. Even Less

PB1200 PLUS External Modem
Qty. 3+ ONLY $79 ea. Even Less
Qty. 1+ $89 ea. Even Less

PB2400 PLUS External Modem

Features
- Fully Hayes™ compatible
- PC Talk III Software Included
- Full or half-duplex operation
- PC™/XT™/AT™ compatible
- Auto-dial, auto answer
- Modifiable non-volatile RAM
- Audio Monitor
- 2 year warranty

PB1200 PLUS External Modem

Features
- Fully Hayes™ compatible
- PC Talk III Software Included
- Full or half-duplex operation
- PC™/XT™/AT™ compatible
- Auto-dial, auto answer
- Auto tone or pulse dialing
- Audio monitor
- 2 year warranty

VISA MasterCard AMERICAN EXPRESS
For your protection we check thoroughly for stolen credit cards.

CALL TOLL FREE FOR INFORMATION OR ORDER
(800) 423-8215
IN OHIO CALL - (800) 321-7731 • FROM ANYWHERE CALL (513) 368-2309
OHIO DEALERS CALL - (800) 222-6571 • DEALERS CALL (800) 528-4504
HOTLINE: 513-368-2307 (For Technical Assistance or Information on Your Order)

MONDAY-FRIDAY
9 AM - 6 PM (EST)
CLOSED SATURDAY
PRICES SUBJECT TO CHANGE
AVAILABILITY AND TYPE ERRORS

MidWest Micro-Peripherals

6910 U.S. Route 36 East, Fletcher, OH 45326

All equipment shipped factory fresh with manufacturers warranty.

MEMBER DIRECT MARKETING ASSOCIATION

HIGH TECHNOLOGY — NOT HIGH PRICES

Star Signature Series

Best 24-Pin Printer Values

SAVE WITH CONFIDENCE - CALL MIDWEST MICRO

NO TAX CHARGED TO RESIDENTS OUTSIDE OHIO
SAME DAY SHIPPING ON ALL ITEMS IN STOCK
TECHNICAL SUPPORT

PRICE GUARANTEE

We at MidWest Micro guarantee that we can save you up to 75% or more on your purchase of new fully warranteed equipment and supplies. And we will still give you friendly, courteous service. Call today and Save With Confidence!

ONE CALL SHOPPING TOLL FREE
DEALERS CALL
800-528-4504

MidWest Micro-Peripherals
6910 U.S. Route 36 East, Fletcher, Ohio 45326
Phone: (513)368-2309

Dear Friends,

Have you postponed buying a high-quality, full featured 24-pin printer because your budget wouldn't stand it? MidWest Micro has the solution to your budget crunch with the new Star Signature Series NB 24-10 and NB 24-15.

Now you can get 24-pin letter quality printing at 9-pin prices, with standard printer features that beat Epson LQ 800/1000 and Toshiba P341E "hands down"! The Star NB 24-10 and NB 24-15 offer faster printing speed, standard equipped tractor feed plus easy front panel operation. A host of other features include choice of type faces for impeccable letter quality documents, expandable 4.5K print buffer for improved productivity and automatic paper feed for high volume work. Star's user-friendly NB 24-10 and NB 24-15 are unequalled investments.

These printers are moving out fast so call one of our friendly sales people today and ensure speedy delivery of your "budget saving" full-featured Star printer . . . the "hands down" winner!

Sincerely,

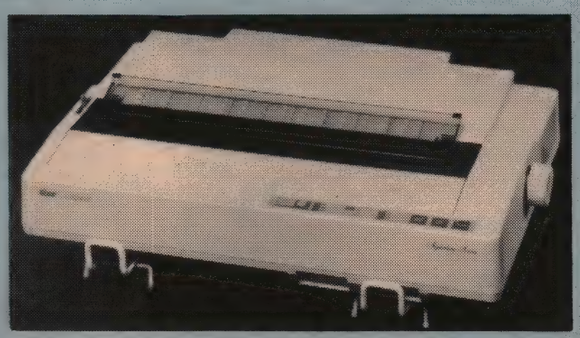
Mark L. Runkle
President

star micronics · inc

Buy from the nations largest Direct Authorized Star Micronics Dealer

Beat Epson & Even Toshiba Features "Hands Down"!

NEW



Star Signature Series

NB 24-10
Your Price
$~~449~~ EVEN LESS
(List - $749)

NB 24-15
Your Price
$~~559~~ EVEN LESS
(List - $999)

COMPLETE star LINE . . .

		Retail	Sale
NX-10	120 CPS + NLQ, Epson/IBM Compatible	$349	~~$169~~
NX-10C	Commodore Compatible	349	~~169~~
NX-1000	NEW Multi-Font Selection, 144 CPS, 4K, Paper Parking	299	~~179~~
NX-1000 Rainbow	Prints 7 Colors, Multiple Font Selection, 144 CPS	379	~~249~~
NX-1000C	Commodore Compatible, Multiple Font Selection, 144 CPS	299	~~179~~
NX-1000C Rainbow	Commodore Compatible, Prints 7 Colors, 144 CPS	379	~~249~~
LV-1215	120 CPS, IBM Compatible, 136 Column	499	~~199~~
LV-1615	160 CPS, IBM Compatible, 16K, 136 Column	699	~~229~~
LV-2015	200 CPS, IBM Compatible, 16K, 136 Column	799	~~299~~
SD-10	160 CPS, IBM/Apple Compatible, Parallel Interface	599	~~219~~
SD-15	160 CPS, IBM/Apple, 15" Carriage	749	~~249~~
SR-10	200 CPS, IBM Compatible, Parallel Interface	679	~~229~~
SR-15	200 CPS, IBM Compatible, 15" Carriage	799	~~299~~
NX-15	120 CPS + NLQ, Epson, IBM Comp., 15" Carriage	529	~~319~~
NR-10	240 CPS, Epson, IBM Comp., 12.6K Print Buffer	579	~~339~~
NR-15	240 CPS, Epson/IBM Comp., 12.6K, 15" Carriage	799	~~429~~
NB24-10	24-Pin, 180 CPS, Epson/IBM Compatible, 8K	749	~~449~~
NB24-15	24-Pin, 180 CPS, Epson/IBM Comp., 15" Carriage	999	~~559~~
NB-15	24-Pin, 300 CPS + LQ, Epson/IBM Comp., 15" Carriage	1399	~~599~~
Laser Printer 8	8PPM, 1 Megabyte Memory, Parallel & Serial	2799	~~1899~~

Star Printer Ribbons . . . . . As Low As **99¢** Each

COMPARE. . .

Star's NB 24-10/15

- Standard Equipped Tractor Feed
- Paper Saving Rear/Push Tractor
- Easy Front Panel Pitch Control
- Easy Front Panel Typeface Selection
- Easy Front Panel Page Length Selection
- Quick Par-Ser Port Change
- LQ 1500/IBM Compatible

Epson LQ 800/1000

- Tractor Extra
- Paper Wasting Top/Pull Tractor
- Software Control Only
- Software Control Only
- Software Control Only
- Must Remove Entire Cover
- LQ 1500 Comp/IBM Extra

NB 24-10/15
"The Hands Down Winner"
Also Features

- 216 cps Draft / 72 cps LQ
- Expandable 4.5K Buffer
- Wide Selection Font Cartridges
- NB 24-15 – 15.5" Carriage

ATTENTION DEALERS Let us help you maximize your profits and minimize your inventory costs. Our exciting prices and delivery schedules will make your bottom line look great! Call 800-528-4504. In Ohio call 800-222-6571.

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For your protection we check thoroughly for stolen credit cards.

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OHIO DEALERS CALL - (800) 222-6571 • DEALERS CALL (800) 528-4504
HOTLINE: 513-368-2307 (For Technical Assistance or Information on Your Order)

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All equipment shipped factory fresh with manufacturers warranty.

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Epson LX-800 & LQ-500 Printers

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TECHNICAL SUPPORT

PRICE GUARANTEE
We at MidWest Micro guarantee that we can save you up to 75% or more on your purchase of new fully warranteed equipment and supplies. And we will still give you friendly, courteous service. Call today and Save With Confidence!

ONE CALL SHOPPING TOLL FREE
DEALERS CALL
800-528-4504

EPSON LX-800

Price Performance Breakthru . . .
180 CPS Speed at 100 CPS Price!

Your Price
$~~199~~
Retail $299 *Even Less*
Quantity 3+ *$CALL$*

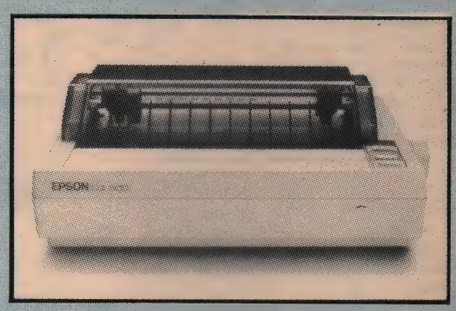
The remarkably easy-to-use LX-800 printer can handle virtually any task. For instance, you can print "hard copies" of business letters, bulletins, newsletters and flyers . . . and on your own stationery, if you like. It is ideal for student term papers and reports. Or for your home use, print out your monthly budget, a list of bills to be paid, your shopping list or personal correspondence. The LX-800 printer by Epson is one of the most reliable, full-featured printers on the market today.

- 180 CPS Draft/30 CPS NLQ
- Both IBM and Epson Compatible
- 3K Print Buffer
- Parallel Interface Standard
- Both Friction and Pull Tractor
- SelecType Front Control Panel
- Two Resident Fonts – Roman or Sans Serif
- Original Plus 2 Copy Capacity
- Automatic Single Sheet Loading
- Works With Virtually All Business & Personal Computer Software
- 1 Year Manufacturer's Warranty

NEW EPSON LQ-500

24-Pin Letter Quality Text With
New "Shadow" & "Outline" Print Modes

For Your Best Price
$CALL$
Quantity 3+ Pricing Available
Retail $529



The New Epson LQ-500 24-pin printer is at home wherever letter quality printing is required, including the expanding world of desktop publishing. The LQ-500's new "Shadow" and "Outline" print modes allow you to create special effects for headlines, etc. The outstanding features of the LQ-500 include high-resolution text and graphics, high-speed operation, and the versatility to handle a variety of paper and forms with the utmost efficiency, from tractor-pulled fanfold paper to the automatic loading of single sheet letterhead. It is the ideal printer for student and home use, as well as the demanding applications of small business.

- 24-Pin Letter Quality Printing
- 180 CPS Draft/60 CPS LQ
- Generous 8K Print Buffer
- Parallel Interface Standard
- Two Built-in LQ Fonts – Roman & Sans Serif
- SelecType Control Panel for Convenient Selection of Draft/LQ Modes, Font Selection
- NEW "Shadow" and "Outline" Print Modes
- Compatible With Most Popular Software Including PageMaker™
- Both Friction and Pull Tractor
- Automatic Single Sheet Loading
- One Year Manufacturer's Warranty

Printers — *Quantity 3+ $CALL*

		Retail	Your Price
LX-800	180 CPS + NLQ, IBM Comp., Tractor	$299	$CALL$
FX-86e	240 CPS, 8K Buffer, IBM Compatible	549	$CALL$
FX-286e	240 CPS, 15" Wide Carriage, IBM Comp.	799	$CALL$
EX-800	300 CPS + NLQ, IBM Comp., Color Option	699	$CALL$
LQ-500	24-Pin, 180 CPS, 8K, IBM Compatible	529	$CALL$
LQ-850	24-Pin, 264 CPS, IBM Comp., SmartPark	849	$CALL$
LQ-1050	24-Pin, 264 CPS, IBM Comp., 15" Carriage	1199	$CALL$

COMPLETE EPSON LINE. . .

Printers

		Retail	Your Price
LQ-2500	24-Pin, 324 CPS, IBM Comp., 15" Carriage	1449	$CALL$

Printer Accessories

		Retail	Your Price
EX-800	Sheet Feed	$199	$CALL$
EX-800/1000	Color Module	79	$CALL$
LQ-800	Tractor Feed	59	$CALL$
LQ-1000	Tractor Feed	69	$CALL$

Quantity 3+ $CALL$

Printer Accessories		Retail	Your Price
LQ-2500/EX-1000	Single Bin Sheet Feed	249	$CALL$
LQ-2500	Color Module	99	$CALL$
LX-86, LX-800 LX-86e,/286e	Serial I/F Board, 2K	59	$CALL$
LX-86, LX-800, LX-86e/286e	Parallel I/F Board, 32K	175	$CALL$

Epson Ribbon Cartridges as low as $2.49 ea.

VISA MasterCard AMERICAN EXPRESS

For your protection we check thoroughly for stolen credit cards.

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OHIO DEALERS CALL - (800) 222-6571 • DEALERS CALL (800) 528-4504

HOTLINE: 513-368-2307 (For Technical Assistance or Information on Your Order)

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HIGH TECHNOLOGY — NOT HIGH PRICES

CLASSIFIED

CLASSIFIED INFORMATION

The classifieds are for **Pre-Owned Items & Software ONLY.** Ads for new equipment must be inserted in the regular display advertising sections including the Showcase Ad section. No logos, or photos, or any other illustrations can be used in the classified ad section.

Instructions

In order for us to keep the ad rate low and insure accuracy, it is necessary that the following procedures are followed.

1. Type or print your ad legibly on a plain sheet of paper. Ads received that are difficult to read will be returned.
2. Write the desired category at the top of each ad. Please refer to the index, this page, if a category is not indicated, ad will be placed in the Miscellaneous section.
3. If more than one ad is submitted, use a separate piece of paper for each ad, making sure your complete name and address is at the bottom of each ad.

CLOSING DATE — 2nd Monday of the month. Example: Ads received by the 2nd Monday of October appear in the December issue. **Due to our low rates, you cannot change, cancel or receive a refund on classifieds after they are typeset.** In most cases, ads are typeset within a week after they are received.

RATES

IMPORTANT: Classified rates as of Jan. 1, 1988 — $1.00 per word, $15 per ad minimum charge. The first two words (if underlined) will be set in bold face at no extra charge. Boldface thereafter will be $.50 additional charge per word. Special bold headings, partial lines, open space or leader dots are:

1 line of leader dots with price, $2.50 per line
6.5 point line, $2.50
10 point bold line, $4.00
Maximum of 15 characters per line

REPEAT ADS

Ads running more than one time. A repeat ad will be coded at the end of the ad with month the ad started and issue ad ends. Example: 8-160. Ad started Aug. ends 160 issue or January. NOTE: Please check to make sure your ad has been correctly coded.

PROOFS

Due to low classified rates a free checking copy or tear sheet cannot be sent if proof of insertion is desired, please send $3.00 extra.

Be sure to include the cost with your ad payment.

PHOTOS

No photos or logos will be allowed in classified ads.

STARS

A line of STARS may be used to draw attention to your ad. Only one size is available at a charge of $5.00.

★ ★ ★ $5.00

CS-ABREVIATIONS

add-post	add postage
add-post-AP	add postage, all prices
FC	Freight Collect
MBG	money back guarantee
PP	postage paid
SASE	send self-addressed stamped evelope for check return or information requested
10 DRP	10 day return privilege
CCR	check clearance required

EXAMPLES OF STYLES:

Normal

PDP 11/03 COMPUTER. Complete operating system with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000 or separate at: 11/03 Computer $900, Dual RX-1 disk $1,000. 32KB memory $2,800. VT-52 video $1,500, GE Terminet 30 printer $800. Intertube video terminal $400. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

PDP 11/03 COMPUTER
Complete **OPERATING SYSTEM** with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at:
11/03 Computer $900
Dual RZ-1 disc $1,000
32KB memory $2,800

10 Point Centered Head

PDP 11/03 COMPUTER

Complete **OPERATING SYSTEM** with RT-11 system software plus basic. **Joe Doe,** POB 1234, Somewhere, USA 00000, 123-456-7890.

Leader Dots

Intertube video terminal $400
Joe Doe, POB 1234, Somewhere, USA 00000. 123-456-7890.

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(101) TANDY COMPUTERS FOR SALE

A DANDY TANDY

TRS-80 Model 12 business computer with dual built-in half-height 8in. floppies, hard disk controller, $250.00. Free catalog. **High Tech Surplus,** 203-723-5694, 235 May Street, Naugatuck, CT 06770. Buy, Sell, Trade.

TRS-80 Model 4P rarely used. Asking $500. **504-446-9865** software included.

Tandy Model 12 (2)-8" drives (1.2 meg), 64K, DMP110 printer, 35 TRSDOS CP/M software programs available. Any 5 or 6 with system. Others $20. $780.00. **(804)272-4348.** Allen R. McCreary, 2325 Scarsborough Drive, Richmond, VA 23235.

★ ★ ★

Tandy computers new & used and software. Mod I's with interfaces, mod III w/CPM, 6 new TDP100's —64k, basic, etc., model 100 clones (K-85). Send SASE for information sheets. **Pyramid Electronics** 2174 Gulf Gate Dr., Sarasota, FL 34231. 813-922-9574.

CLOSING DATE — 1st Thursday of the month. Example: Ads received by the 1st Thursday of January appear in the March issue. **Due to our low rates, you cannot change, cancel or receive a refund on classifieds after they are typeset.** In most cases, ads are typeset within a week after they are received.

RATES

IMPORTANT: Classified rates as of Jan. 1, 1989 — $1.30 per word, $19.50 per ad minimum charge. The first two words (if underlined) will be set in bold face at no extra charge. Bold face thereafter will be $.65 additional charge per word. Special bold headings, partial lines, open space or leader dots are:

1 line of leader dots with price, $3.30 per line
6.5 point line, $3.30
10 point bold line, $5.30
(Maximum of 15 characters per 10 pt bold line)

CLASSIFIED ORDER FORM

Classified Dept., COMPUTER SHOPPER
P.O. Box F, Titusville, FL 32781

To figure cost of ad, the rate is $1.00 per word. (.50 cents extra per word bold face) $15.00 per ad minimum charge.

Run under heading # _____
See Index This Page
(Please type or print)

(For additional words, use separate sheet of paper)

Name _____

Address _____

City _____ State _____ Zip _____

INCLUDE $1.00 PER WORD FOR YOUR NAME AND ADDRESS

Run class ad for_____Issues Payment of $_____ Enclosed

CLASSIFICATION NUMBER AND CATEGORY

COMPUTERS (Large)
(133) Burroughs Systems 000
(136) Data General Systems 542
(138) Data General, Software, Peripheral 000
(148) DEC Systems For Sale 542
(149) DEC Systems Wanted 000
(150) DEC Software, Peripheral 000
(154) IBM Systems For Sale 000
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(156) IBM, Software, Peripheral 542
(166) Misc. (Hardware & Software) 543

MICRO COMPUTERS
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(116) NEC Computers For Sale 539
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(104B) Texas Instr. Software, Peripheral 531
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(126) Misc. Microcomputers 542
(128) Misc. Micro, Software, Periph. 000
(129) S-100 Computers 542
(130) S-100 Compatible Peripheral 542
(131) S-50 Compatible Peripheral 542

PERIPHERAL & MISC. EQUIPMENT
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(174) Printers 543
(178) Tape Drives 543
(180) CRTS, Monitors 543
(181) CRT Terminals 543
(182) Terminals 543
(183) Multibus Boards 543
(184) Memory 543
(186) Modems 543
(187) Word Processing 000
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(189) Books, Magazines 544
(190) Misc. Large Systems 544
(191) CP/M Software 544
(192) Misc. Software 545
(194) Misc. Accessories & Supplies 545
(194A) Minicomputers 000
(195) IC's and Components 545

MISCELLANEOUS
(196) Help Wanted 545
(198) Positions Wanted 545
(199) Other 545
(200) Non-Computer 545

LAPTOPS
100/200/600
USED STUFF!!

We Have many Radio Shack model 100 programs starting at only $10.00 each.

Model 100 32k	$275.00
Model 100 32k	$325.00
Model 200 24k	$325.00
Model 600	$425.00
Bar Code Wand	$60.00
Disk Drives	CALL
Printer or Modem cable	$10.00
ROMS	CALL

SPECIAL OF THE MONTH
Disk Video Interface ONLY $115.00
We buy, sell, & horsetrade TRS Laptops and accessories. Call!! **Shreve Systems,** 2421 Malcolm St., Shreveport, LA 71108.

318-865-6743.

10-106

(102) TANDY COMPUTERS WANTED

WANTED
Shreve Systems buys GOOD Apples, IBM's & Laptops, printer parts & accessories. NO JUNK PLEASE!!! **SHREVE SYSTEMS** 2421 Malcom St., Shreveport, LA 71108. **318-865-6743.** 09-106

(103) TANDY SOFTWARE, PERIPHERAL

COCO PUBLIC Domain Software. Free catalog. Dynamic Color News, COCO Magazine $2 sample. Dynamic Electronics, Box 896, Hartselle, AL 35640; **205-773-2758.** 11-107

COCO Public domain programs. Over 100 packs on disk or cassette as low as $3.50. Send for free catalog. **P D Software** PO Box 130256-CC, Houston, TX 77219. 09-106

CoCo Clipboard Magazine is the only magazine for the CoCo focusing on practical/business uses for the CoCo 2&3. $15.00 for six issues (1 year). Sample copy $3.75 (send 1st class). Check or money order to: **CoCo Clipboard Magazine,** Dept. CS, 3742, U.S. 20—Box 3, Fredonia, NY 14063. 10-106

★ ★ ★

Color computer programs for only 50¢ each! Many machine language! Send $5.00 for 10 programs on tape or disk or write for free catalog. **Coco Software,** PO Box 1256, Holland MI 49422-1256. 616-399-9648. 06-106

FREE SOFTWARE!!! TRS80s, Tandys. Send stamps! **EZRAEZRA,** Box 5222PRNV, San Diego, CA 92105.

HUGE SAVINGS!!!
Tandy original software WITH FULL DOCUMENTATION for ALL Tandy models (Specify model). Send $1.00 & LSASE to **King Micro,** Box 72189, Columbus, Ohio 43207. 11-107

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7400

Part No.	1-9	10+	Part No.	1-9	10+
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7402	.29	.19	7486	.45	.35
7404	.29	.19	7489	1.95	1.85
7405	.35	.25	7490	.49	.39
7406	.39	.29	7493	.45	.35
7407	.39	.29	74121	.39	.29
7408	.35	.25	74123	.49	.39
7410	.29	.19	74125	.55	.45
7414	.49	.39	74126	.55	.45
7416	.35	.25	74143	4.95	4.85
7417	.35	.25	74150	1.35	1.25
7420	.29	.19	74154	1.35	1.25
7430	.29	.19	74158	1.49	1.39
7432	.39	.29	74173	.79	.69
7438	.39	.29	74174	.59	.49
7442	.49	.39	74175	.59	.49
7445	.79	.69	74176	.79	.69
7446	.89	.79	74181	1.95	1.85
7447	.89	.79	74189	1.95	1.85
7448	1.95	1.85	74193	.79	.69
7472	.39	.29	74198	1.85	1.75
7473	.39	.29	74221	.99	.89
7474	.39	.29	74273	1.95	1.85
7475	.49	.39	74365	.59	.49
7476	.45	.35	74367	.59	.49

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74LS05	.28	.18	74LS174	.39	.29
74LS06	.59	.49	74LS175	.39	.29
74LS07	.59	.49	74LS189	3.95	3.85
74LS08	.28	.18	74LS191	.59	.49
74LS10	.26	.16	74LS193	.69	.59
74LS14	.49	.39	74LS221	.69	.59
74LS27	.35	.25	74LS240	.59	.49
74LS30	.28	.18	74LS243	.69	.59
74LS32	.28	.18	74LS244	.69	.59
74LS42	.49	.39	74LS245	.79	.69
74LS47	.89	.79	74LS259	.99	.89
74LS73	.39	.29	74LS273	.89	.79
74LS74	.35	.25	74LS279	.49	.39
74LS75	.39	.29	74LS322	3.49	3.39
74LS76	.39	.29	74LS365	.49	.39
74LS85	.59	.49	74LS366	.49	.39
74LS86	.29	.19	74LS367	.49	.39
74LS90	.49	.39	74LS368	.49	.39
74LS93	.49	.39	74LS373	.79	.69
74LS123	.49	.39	74LS374	.79	.69
74LS125	.49	.39	74LS393	.89	.79
74LS138	.49	.39	74LS590	5.95	5.85
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74F

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74F10	.25	74F240	.69
74F32	.25	74F244	.69
74F74	.29	74F253	.59
74F86	.39	74F373	.79
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CD4013	.29	CD4093	.35
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*41256-120	262,144 x 1	(120ns)	12.95
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*6264P-15	8192 x 8	(150ns) (CMOS)	9.95
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6514	1024 x 4	(350ns) (CMOS)	3.75
*43256-15L	32,768 x 8	(150ns) Low Power	14.95
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TMS2532A	4096 x 8	(450ns) 21V	4.49
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27C16	2048 x 8	(450ns) 25V (CMOS)	4.25
2732	4096 x 8	(450ns) 25V	3.95
2732A-20	4096 x 8	(200ns) 21V	4.25
2732A-25	4096 x 8	(250ns) 21V	3.95
27C32	4096 x 8	(450ns) 25V (CMOS)	4.95
2764-20	8192 x 8	(200ns) 21V	4.25
2764-25	8192 x 8	(250ns) 21V	3.59
2764A-25	8192 x 8	(250ns) 12.5V	3.69
2764-45	8192 x 8	(450ns) 21V	3.39
27C64-15	8192 x 8	(150ns) 12.5V (CMOS)	5.95
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27128A-25	16,384 x 8	(250ns) 12.5V	5.25
27C128-25	16,384 x 8	(250ns) 21V (CMOS)	5.95
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27C256-25	32,768 x 8	(250ns) 12.5V (CMOS)	6.25
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EEPROMS

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*No specs. available
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74C/CMOS

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74C04	.29	74C221	1.79
74C08	.29	74C240	1.19
74C10	.19	74C244	1.79
74C14	.49	74C373	1.95
74C32	.29	74C374	1.95
74C74	.49	74C912	7.95
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74C86	.29	74C920	4.95
74C89	3.95	74C921	4.95
74C90	.99	74C922	3.95
74C154	2.95	74C923	3.95
74C173	.59	74C925	5.49

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2N3904	.12	1N751	.15	C106B1	.49

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MPC121 SPDT, On-Off-On 1.19 | MS102 SPST, Momentary .39

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XC556G	T1¾, Green .17	XC556C	T1¾, Clear/Red .17

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14LP	.12	14WW	.65
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28LP	.27	28WW	1.39
40LP	.29	40WW	1.89

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74HC08	.19	74HC244	.79
74HC10	.25	74HC245	.79
74HC14	.29	74HC253	.49
74HC30	.25	74HC259	.49
74HC32	.29	74HC273	.59
74HC74	.29	74HC373	.69
74HC75	.35	74HC374	.69
74HC76	.35	74HC595	1.29
74HC85	.55	74HC688	1.49
74HC86	.35	74HC943	8.95
74HC123	.69	74HC4040	.89
74HC125	.49	74HC4049	.39
74HC132	.49	74HC4050	.39
74HC138	.45	74HC4060	.99
74HC139	.45	74HC4511	1.19
74HC154	1.49	74HC4514	1.79
74HC163	.49	74HC4538	1.19
74HC174	.59	74HC4543	1.19

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74HCT00	.17	74HCT139	.39
74HCT02	.17	74HCT157	.29
74HCT04	.19	74HCT174	.35
74HCT08	.17	74HCT175	.39
74HCT10	.17	74HCT240	.69
74HCT32	.19	74HCT244	.59
74HCT74	.29	74HCT245	.69
74HCT86	.25	74HCT373	.49
74HCT138	.39	74HCT374	.49

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LF351N	.39	26LS33	1.49
LF353N	.49	LM2901N	.25
LF355N	.79	LM2907N	1.29
LF356N	.79	LM2917N (8 pin)	1.79
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LM360N	1.95	MC3450P	.49
LM361N	1.49	MC3470P	1.19
LM380N-8	.99	MC3471P	.99
LM386N-3	.89	MC3479P	3.95
LM387N	1.09	MC3486P	1.19
LM393N	.39	MC3487P	.99
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LM567V	.75	7815K (LM340K-15)	1.59
NE592N	.75	7805T (LM340T-5)	.45
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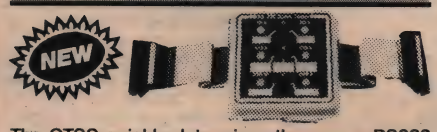

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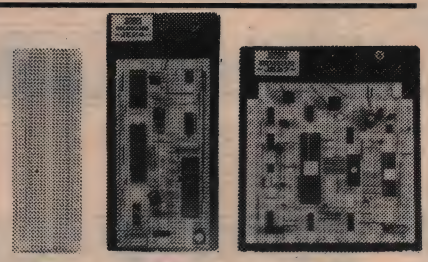

	JE23	JE24	JE27	
Part No.	Dim. L" x W"	Contact Points	Binding Posts	Price
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JE21	3¼ x 2⅛	400	0	$ 4.95
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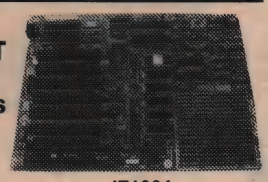

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- AMI BIOS ROMs included

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JE1002 4.77/10MHz (PC/XT).... $109.95
JE3005 8/12MHz (AT)..... $329.95

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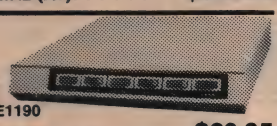

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JE1190 Power Base..... $29.95
JE1191 6-Outlet Power Strip $11.95

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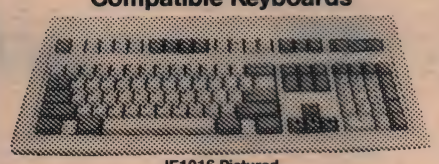

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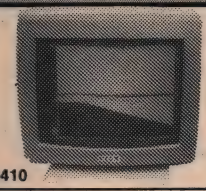

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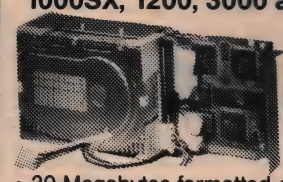

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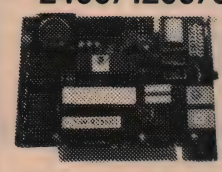

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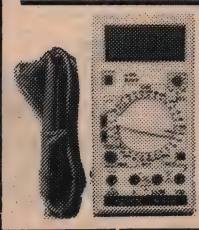

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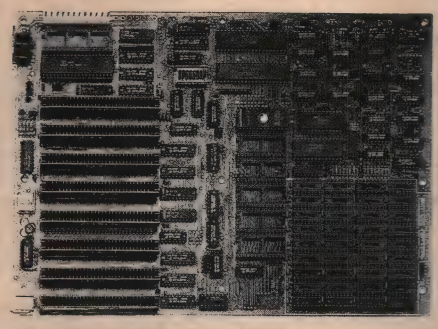
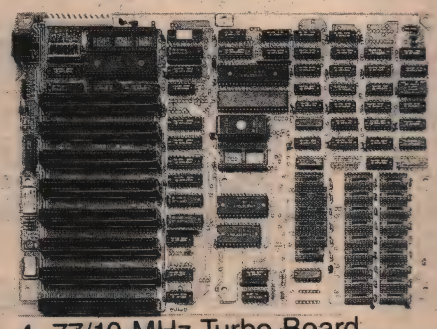
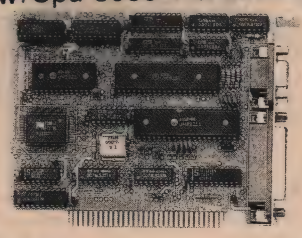


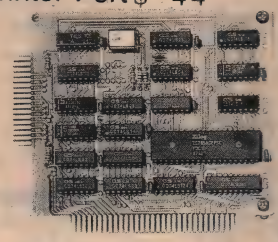
4. 77/8 MHz Turbo Board w/Cpu 8088-2 & 2764 $56



4. 77/10 MHz Turbo Board w/Cpu 8088-1 & 2764 $59.50



Monochrome Graphic Card w/Printer Port $ 44



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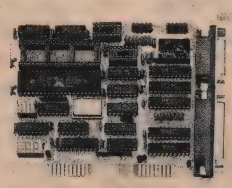

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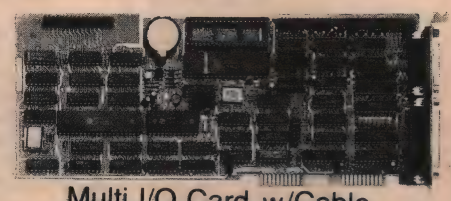
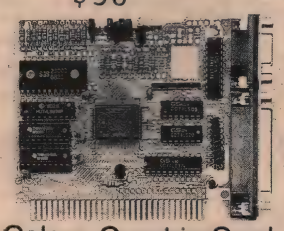


Multi I/O Card w/Cable $38



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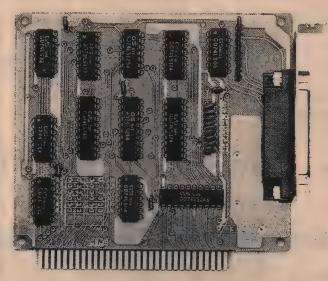

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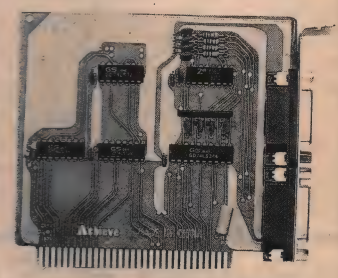
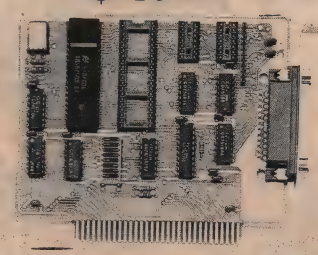
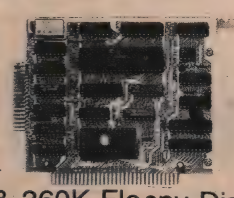


Game Card $16



At Multi I/O Card w/Cable $36



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The MP-5300AI is a 300 cps, wide carriage printer that zips through spreadsheets, correspondence, graphics and reports. It features a 6K print buffer that keeps your computer free for the next job. The MP-5300AI is an easy printer to use. You can set margins, print style and much more from the front panel. Its hard to imagine that we can sell this hard-working printer for under $500. However, if you call now you can start enjoying better output and reduced costs right away.

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Sincerely,

Mark Runkle

Mark L. Runkle
President

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300 – 360 CPS Wide Carriage

Retail $999

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- High Speed 300 CPS Draft/50 CPS NLQ
- Wide 15.5", 136 Column Carriage
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- Large 6K Print Buffer
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- Variety of Printing Styles – Double-Width, Bold, Double-Strike, Italic, Superscript/ Subscript & Underlining
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Seikosha BP-5420AI

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Now you can conquer your heavy printing load with Star's sensational new NB-15, 24-pin printer. This workhorse printer will speed through multi-page reports, detailed spreadsheets, critical correspondence and high resolution graphics. This versatile well-built printer will score big when it counts. If you need a serious, high-speed performance printer for making carbons, running through continuous forms or creating presentation graphics, the NB-15 is an ***unbeatable value.***

No other letter quality printer is this easy, this fast and this good. Its easy front panel control allows fingertip selection of 19 functions (3 font styles, 4 print pitches, 8 form lengths, 2 print modes and 2 margin settings). You can achieve precise paper positioning with one-ninetieth inch increments and top-of-form is easily set. And this 24-wire printer is fast. It creates commanding graphics and text at a super fast 300 CPS draft and 100 CPS letter quality. Star's proprietary 24-wire printhead creates such fine letter quality characters that the appearance rivals professional typesetting.

The Star NB-15 is a real workhorse. Your business deserves the best and the NB-15 is the best 24-pin printer on the market. Call us today and we will help you find the solution for your printing needs.

Sincerely,

Mark L. Runkle
President

P.S. – The Star NB-15 is an affordable 24-pin printer that will make short work of your printing load.

24-Pin Corporate Workhorse . . .

star micronics NB-15

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$599
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- 24-Wire Dot Matrix Printing
- Fast 300 CPS Draft
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- Huge 16K Print Buffer
- Standard Parallel Interface
- Paper Saving Push Tractor Feed
- Easy Front Panel Operation - Fingertip Selection of 19 Functions
- Original +3 Copy Capacity
- Automatic Paper Feed
- Optional Font Cartridges
- One Year Manufacturer's Warranty

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24-Pin, 15" Carriage
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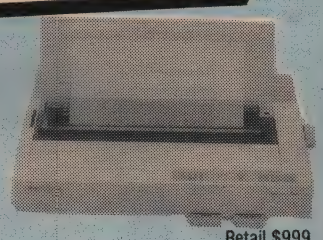

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- Both IBM & Epson Compatible
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- High Resolution Graphics
- Optional Font Cartridges
- Front Panel Control
- One-Year Manufacturer's Warranty

star micronics NB24-10
24-Pin Letter Quality
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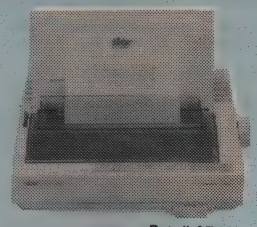

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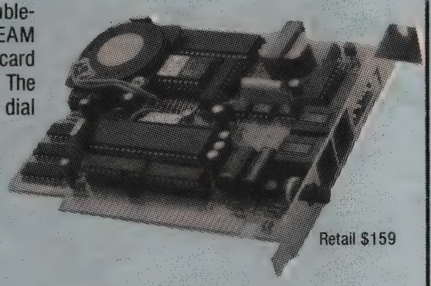

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- 40 Character Command Buffer
- Speaker With Volume Control
- 2 Phone Jacks
- Two Year Manufacturer's Warranty

SmarTEAM 1200AT
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SmarTEAM's 1200AT external modem has 8 status indicator lights to keep you fully informed of transmission progress. The exciting CompuServe subscription offer gets you on-line fast so you can access nearly 700 information services.

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- Speaker With Volume Control
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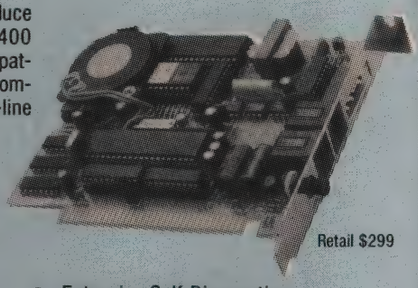
SmarTEAM 2400B
2400 Baud Internal Modem

Double your transmission time and reduce your phone charges with SmarTEAM's 2400 baud internal modem. It is fully Hayes compatible and works with IBM PC, XT AT and compatibles. The 2400B has all the top-of-the-line features you'd expect.



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The SmarTEAM 2400 external modem features a non-volatile RAM to store frequently dialed phone numbers. It has 2 standard phone jacks that allows you to switch from data transmission to voice communication. The fast 2400 baud transmission rate saves time and money.

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- Complete With Quick Link Software
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- Auto Dial/Auto Answer
- Extensive Self-Diagnostics
- 8 Status Indicator Lights
- Non-Volatile RAM Stores Phone Numbers
- Speaker With Volume Control
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star micronics NX-2400 Multi-Font Printer

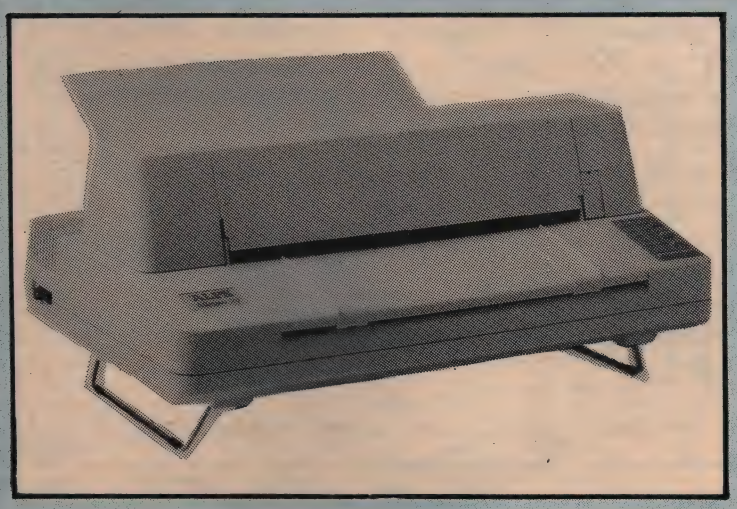
The NX-1000 Multi-Font Legend Carried Into A 24-Wire Printer

Now you can have it all with Star's NEW NX-2400 Multi-Font printer. The NX-2400 is a high speed, high resolution 24-wire printer at an affordable 9-wire price. The Star NX-2400 is destined for legendary status with its 24-wire letter quality print, 30 typestyle selection, convenient "paper parking" feature and 360 x 360 dots per inch graphics resolution. Add in its 170 CPS print speed and you've got a printer that delivers all the performance you'll need. Spreadsheets are a breeze, graphics exceptional and database management easy with the NX-2400's superior performance. All this at a price that can't be beat.

- 24-Wire LQ Printing
- 30 Typestyle Selection
- 170 CPS Draft/57 CPS LQ
- Both IBM & Epson Compatible
- "Paper Parking" Feature
- 7K Print Buffer Memory
- Both Tractor & Friction Feed
- High Resolution (360 x 360 DPI)
- Quiet Mode Reduces Decibel Level
- High Resolution Graphics
- Optional Font Cartidges
- One Year Manufacturer's Warranty

Retail $529

Your Price
$329 *Even Less*



ALPS AMERICA Allegro 24

Built By Popular Demand . . .

The NEW Alps Allegro 24 brings you letter quality text and high resolution graphics in an advanced 24-pin printer. It's superior paper handling features include built-in tractor for fanfold paper and flat-bed paper path that routes paper straight from the tractor to the printhead. The unique flat-bed paper path makes label printing a breeze and virtually eliminates paper jams. The Allegro 24 includes a tear bar so you don't waste paper and it features a unique top-of-form setting to customize alignment of pre-printed forms. You can count on the sturdy and versatile Allegro 24 to handle all your printing tasks.

FREE ALPSMate Software Diskette... This printer control utility is memory resident and gives you full access to all of the printer's capabilities from within any software package including bold, italics, sideways printing and down loadable characters. Retail Value – $70 . . . it's FREE with every Allegro 24 printer.

- 24-Pin Letter Quality Printing
- Fast 180 CPS Draft/60 CPS LQ
- Both IBM and Epson Compatible
- Standard Parallel Interface
- Big 7K Print Buffer
- Unique Flat-Bed Paper Path
- Built-In Tractor With Tear Bar
- Custom Top-Of-Form Setting
- Convenient "Paper Parking" Feature
- 4 Resident Fonts With 200 Print Variations Per Font
- One Year Manufacturer's Warranty

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180 CPS Speed at 100 CPS Price!

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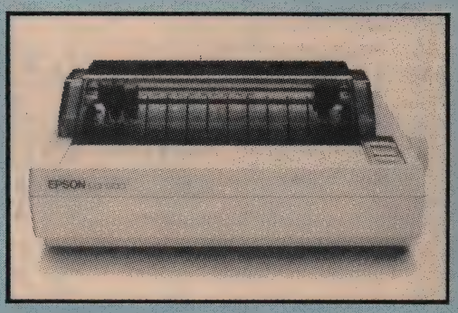
- 180 CPS Draft/30 CPS NLQ
- Both IBM and Epson Compatible
- 3K Print Buffer
- Parallel Interface Standard
- Both Friction and Pull Tractor
- SelecType Front Control Panel
- Two Resident Fonts – Roman or Sans Serif
- Original Plus 2 Copy Capacity
- Automatic Single Sheet Loading
- Works With Virtually All Business & Personal Computer Software
- 1 Year Manufacturer's Warranty

NEW EPSON LQ-500

24-Pin Letter Quality Text With
New "Shadow" & "Outline" Print Modes

For Your Best Price
$CALL$
Quantity 3+ Pricing Available
Retail $529



The New Epson LQ-500 24-pin printer is at home wherever letter quality printing is required, including the expanding world of desktop publishing. The LQ-500's new "Shadow" and "Outline" print modes allow you to create special effects for headlines, etc. The outstanding features of the LQ-500 include high-resolution text and graphics, high-speed operation, and the versatility to handle a variety of paper and forms with the utmost efficiency, from tractor-pulled fanfold paper to the automatic loading of single sheet letterhead. It is the ideal printer for student and home use, as well as the demanding applications of small business.

- 24-Pin Letter Quality Printing
- 180 CPS Draft/60 CPS LQ
- Generous 8K Print Buffer
- Parallel Interface Standard
- Both Friction and Pull Tractor
- Automatic Single Sheet Loading
- One Year Manufacturer's Warranty
- Two Built-in LQ Fonts – Roman & Sans Serif
- SelecType Control Panel for Convenient Selection of Draft/LQ Modes, Font Selection
- NEW "Shadow" and "Outline" Print Modes
- Compatible With Most Popular Software Including PageMaker™

Printers — *Quantity 3+ $CALL*

		Retail	Your Price
LX-800	180 CPS + NLQ, IBM Comp., Tractor	$299	$CALL$
FX-86e	240 CPS, 8K Buffer, IBM Compatible	549	$CALL$
FX-286e	240 CPS, 15" Wide Carriage, IBM Comp.	799	$CALL$
EX-800	300 CPS + NLQ, IBM Comp., Color Option	699	$CALL$
LQ-500	24-Pin, 180 CPS, 8K, IBM Compatible	529	$CALL$
LQ-850	24-Pin, 264 CPS, IBM Comp., SmartPark	849	$CALL$
LQ-1050	24-Pin, 264 CPS, IBM Comp., 15" Carriage	1199	$CALL$

COMPLETE EPSON LINE. . .

Printers

		Retail	Your Price
LQ-2500	24-Pin, 324 CPS, IBM Comp., 15" Carriage	1449	$CALL$

Printer Accessories

		Retail	Your Price
EX-800	Sheet Feed	$199	$CALL$
EX-800/1000	Color Module	79	$CALL$
LQ-800	Tractor Feed	59	$CALL$
LQ-1000	Tractor Feed	69	$CALL$

Quantity 3+ $CALL$

Printer Accessories

		Retail	Your Price
LQ-2500/EX-1000	Single Bin Sheet Feed	249	$CALL$
LQ-2500	Color Module	99	$CALL$
LX-86, LX-800 LX-86e,/286e	Serial I/F Board, 2K	59	$CALL$
LX-86, LX-800, LX-86e/286e	Parallel I/F Board, 32K	175	$CALL$

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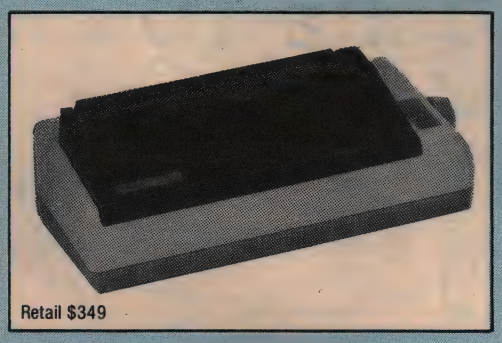
Commodore Plug 'n Play


Retail $349

star micronics
SG/SL-10C
Your Price
$99

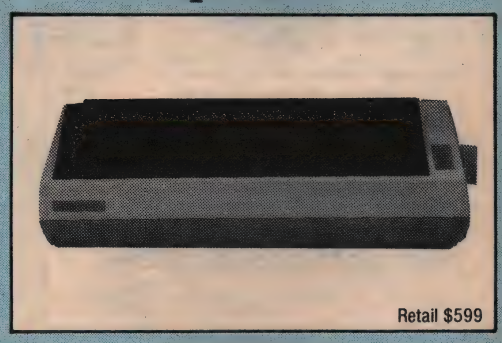
The Star SG/SL-10C fits with your Commodore computer like it was made for it. And it was! All you have to do is plug it in and start printing. The price alone of this Commodore compatible printer makes it an unbeatable value but you'll enjoy much more after putting it into operation.

- 120 CPS Draft/30 CPS NLQ
- Ample 2K Print Buffer
- Plug 'n Play Commodore Compatible
- Both Tractor & Friction Feed
- Short Form Tear-Off Feature
- Standard Serial Interface
- Skip Over Perforation
- One Year Manufacturer's Warranty

Inexpensive Spool Ribbons - *Low As 99¢ each*

15" Carriage – Ideal For Spreadsheets. . .

star micronics
SG-15
Your Price
$189

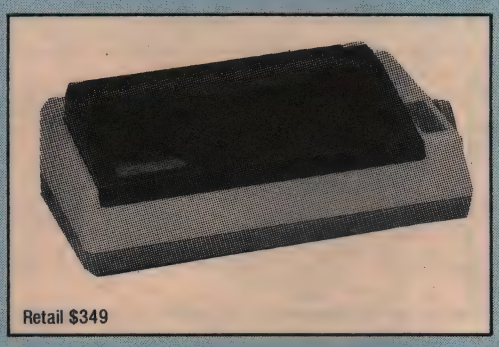

Retail $599

You'll get more work done in less time with Star's heavy duty, wide carriage SG-15 printer. The popular SG series printers are loaded with built-in tractor for form-fed paper, large 16K print buffer that lets you use your computer while printing and short form tear-off feature for easy forms handling.

- 120 CPS Draft/30 CPS NLQ
- Wide 15", 136 Column Carriage
- Large 16K Print Buffer
- Both IBM and Epson Compatible
- Both Tractor & Friction Feed
- Short Form Tear-Off Feature
- High Resolution Graphics
- Standard Parallel Interface
- One Year Manufacturer's Warranty

Inexpensive Spool Ribbons - *Low As 99¢ each*

Star's Most Popular Printer Ever. . .


Retail $349

star micronics
SG-10
Your Price
$119

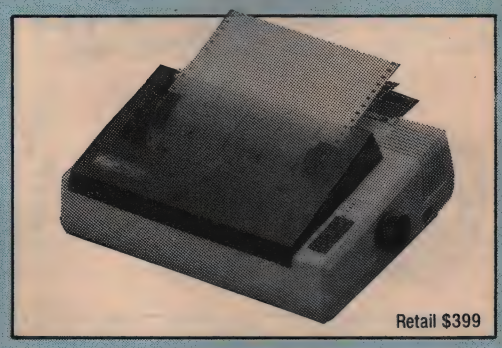
No wonder the SG-10 is Star's most popular printer ever. It does so much so well and it's built to last. It's a full-featured printer that lets you fit more work into every second. Use it for word or data processing and high resolution graphics. The SG-10 is a perfect fit for your IBM or compatible computer.

- 120 CPS Draft/30 CPS NLQ
- Ample 2K Printer Buffer
- Both IBM and Epson Compatible
- Both Tractor & Friction Feed
- Short Form Tear-Off Feature
- High Resolution Graphics
- Standard Parallel Interface
- One Year Manufacturer's Warranty

Inexpensive Spool Ribbons - *Low As 99¢ each*

High Performance/Low Cost . . .

star micronics
LV-1210
Your Price
$119


Retail $399

The Star LV-1210 is a top quality printer at an affordable price. It has such word processing enhancements as continuous underline, emphasized print and block graphics. You'll love its high resolution graphics output for everything from reports to presentations to special projects. The Star LV-1210 gives you crisp, consistent printing every time.

- 120 CPS Draft/30 CPS NLQ
- 816 Bytes Print Buffer
- Compatible With IBM & Compatibles
- Both Tractor & Friction Feed
- Ultra High Resolution Graphics
- Standard Parallel Interface
- Original +2 Copy Capacity
- One Year Manufacturer's Warranty

Inexpensive Spool Ribbons - *Low As 99¢ each*

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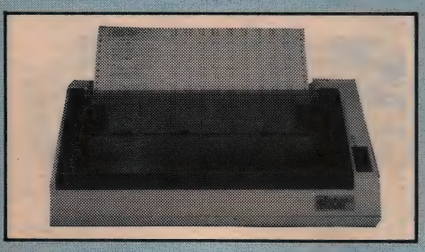
star micronics Delta-15



160 CPS Plus Wide Carriage

Your Price
$169

When you buy the 160 CPS Delta-15, you're buying time. It makes short work of such labor intensive jobs as spreadsheet analysis and multiple page reports. The Delta-15 features a built-in tractor plus bottom paper feed so forms and labels are a breeze. For correspondence quality printing for business and professional needs, choose the Star Delta-15

- 160 CPS Print Speed
- Wide 15", 136 Column Carriage
- Big 8K Print Buffer
- Uses Standard Star Codes
- Both Tractor & Friction Feed
- Both Parallel & Serial Interfaces
- 10,12,17,5,6 & 8.5 Characters Per Inch
- Bottom Paper Feed
- One Year Manufacturer's Warranty

star micronics Delta-10

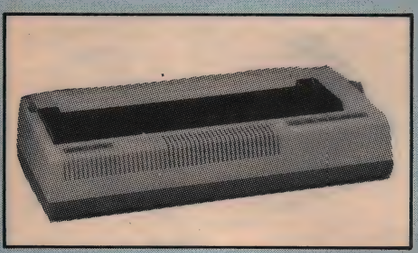
Fast Workhorse Printer. . .

Your Price
$129

Star's Delta-10 produces 160 crisp characters every second with a 100% duty cycle. Its large 8K print buffer means you can keep using your computer even while printing. The Delta-10 has versatile paper handling capabilities with both tractor and friction feed. And the Delta-10 is inexpensive to operate since it uses standard spool-to-spool ribbons.

- 160 CPS Print Speed
- Big 8K Print Buffer
- Uses Standard Star Codes
- Both Tractor & Friction Feed
- Both Parallel & Serial Interfaces
- 10,12,17 CPS Plus Enlarged, Double Strike, Italics, Super & Subscripts
- One Year Manufacturer's Warranty

star micronics Radix-15



Wide Carriage Business Printer

Your Price
$259

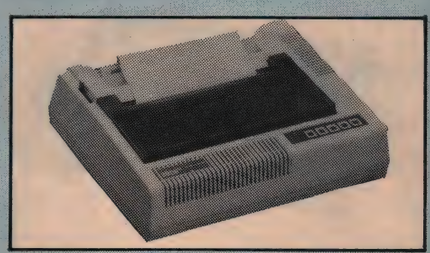
The Star Radix-15 is a truly versatile printer with its work capable wide paper carriage and large time saving 16K print buffer. No leading business printer has more memory. It offers high quality print and handles columns of data, word intensive reports and fine looking correspondence. The Star Radix-15 is ready to run with many popular software packages.

- Fast 200 CPS Print Speed
- Wide 15", 136 Column Carriage
- Time Saving 16K Print Buffer
- Uses Standard Star Codes
- Both Parallel & Serial Interfaces
- Both Tractor & Friction Feed
- Graphics Capable
- Original +2 Copy Capacity
- One Year Manufacturer's Warranty

star micronics Radix-10

Economical, 200 CPS Printer

Your Price
$169



The Star Radix-10 is a high speed printer economical enough for your home use and sophisticated enough for office use. You can print anything from computer paper to letterhead stationery and envelopes . . . even multi-part forms. The Radix quality print will suit your particular printing needs.

- Fast 200 CPS Print Speed
- Time Saving 16K Print Buffer
- Uses Standard Star Codes
- Both Parallel & Serial Interfaces
- Both Tractor & Friction Feed
- Graphics Capable
- Original +2 Copy Capacity
- One Year Manufacturer's Warranty

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More Timex Sinclair continued from page 479

This years event was sold out to exhibitors, and was produced at a profit level financially.

During both days, a series of fourteen seminars provided further insight into a variety of topics:

MSDOS and how it relates to Sinclair syntax and Amstrads MS/PCDOS.
Forth Update
Z-80 Machine Code
C-Language
ZX-81 The ins-and-outs of PC8300
Disk Systems for the ZX-1000
Data Transfer from the ZX-100 to the TX/2068
Video Digitizing
General Hardware Projects
Intro to the QL for new users
QL Advanced Applications

What often makes these events memorable is the unexpected, like this years surprise guest speaker-Nigel Searles. Nigel first arrived from England in 1982, acting as the head of Timex Marketing and mail order for the ZX-81. From 1982 to 1985 he acted as the Managing Director, and Chief Officer for Sinclair Research. When Timex abandoned its line, he returned to Europe. Nigel has relocated to New England, and attended this years conference to present a seminar on the History of Sinclair from the ZX-80 to Z-88. His well received seminar covered the history and perspective, with a polite, no-holds-barred commentary on his disagreements with Sir Clive.

What followed was an attempt to solicit support for SNUG (Sinclair North American Users Group). Understandably, this was met with welcome arms and skepticism. The general opinion appears to be one of, this is too far-too fast-with little support. Those in attendance were saying YES, lets establish a national society or organization. But with local chapters or governing bodies to offer input. The open session closed with Nigel taking notes, and others taking note!

Now, to the heart of the matter—Tell me Mike, what exactly is new for my computer? Are there new startling software developments, add-ons, hardware projects, books, manuals—what? Other than a few standouts, sadly, very little. In all fairness, these regional conferences tend to offer only the products that are indiginous to the area (by virtue of driving distance). True—Stan Lemke and the other pioneers were not there.

Developments for the TS/1000? First of all, the usual firesale offering of dusty Timex cassettes, that Geraldo Rivera found next to Al Capones liquor bottles. These are however a boon to new users, or those of us that may be missing a few from the complete collection. Zebra sold a number of Memotech products. (64K RAMpacks etc.). The standouts were threefold. First a seminar on the PC8300, a study and analysis. Secondly, Bill Bell spoke on how he developed a disk system, which he demoed. In the traditional Sinclair user fashion, Bill is not offering this for sale, but further elaborated on how you can duplicate his efforts. The third highpoint of the event for TS/1000 users, was a demonstration by General Robotics. Who would have ever dreamed that one day we would utilize the TS/1000 for robotics?

The TS/1500 went virtually unnoticed, although there were several new units still up for sale. In many instances the hardware projects displayed could be used on the TS/1500.

Without Curry Computer at this years regional event, the Spectrum and ROMemulated TS/2068s also went all but unnoticed. While on the subject, in addition to the huge selection of software and hardware available for the Spectrum, Curry has begun to market select Amstrad products as well.

Brice Road Pharmacy appeared as the shows only Amstrad dealer, displaying the PC-1640 MSDOS based unit, and the PPC-640 laptop. What I find fascinating as an owner of the PC-1512 & PCW-8256, is the total lack of national support provided by Amstrad. While in Europe, it was virtually impossible to go anywhere without seeing, touching or hearing about Amstrad. Their international and European marketing prowess is the yardstick for many. Since their purchase of VIDCO, I find their debut in the states to be flat at best. In my opinion, they have left the users (and possibly the dealers) high and dry. Users of PCW-8256 units are starving for any selection of fair priced software. As for those of us with MSDOS based Amstrads, Alan Sugar is missing the boat by not marketing an exclusive line of Amstrad products. While it is true that the number of dealers have increased, their market share has not. He has failed to play the trump card that won his battles abroad—advertising. The Amstrad product line is unequalled, extraordinary products at rock bottom prices, but you can't sell 'em if they don't know about them. Alan, where are you?

Pardon me if I limp while I talk, I almost fell getting off my soapbox. Last, and certainly not least, the star of the show, the Sinclair QL. Nearly all attention was on the QL, which continues to sell yet is no longer produced. Also, oddly enough, there are more TS/2068s in users hands than QLs, yet the QL still spark the eyes of conference goers. Sharpes and A + Computer Response sold a number of heavily discounted QLs at this years show. Much like their Sinclair predecessors, QL owners are a breed of their own, devoted almost exclusively to the upkeep and expansion of their units; and rightfully so.

Andy Kosiorek, Frank Davis and others made this years show memorable. Conferences like these cannot be measured on attendance and dollar bills. It is precisely because of organizers like Frank, Andy and others, that we rise at 4 a.m., drink bad truck stop coffee, and chase the countless miles of concrete ribbon. The Sinclair user has the wind in their hair of a thousand places, and when they arrive, they search through that last dusty stack of surplus

continued on page 554

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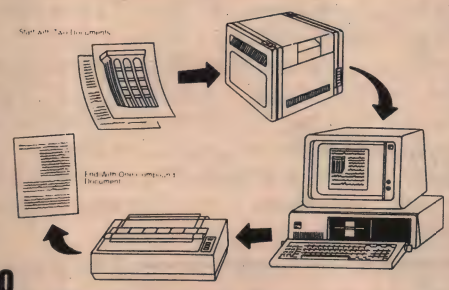

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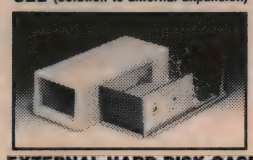

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Min. Quantity-50 sets

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You Have To Give It Away To Get It

by Jim Horn

Recently as I sat thinking about some of the awful things I needed to do, the postman saved my day. *Computer Shopper* was in the fistful of mail he handed me, which was enough to make me ignore the usual assortment of letters addressed to my neighbors.

The latter part of Dr. Ron Albright's article about the Maine school teacher Eunice Spooner caught my eye. (I always turn to TI Forum.) Ron had a real heart warmer this month. What a story! I picked up the phone and called Vice President Bush's office.

I told them the story of Eunice Spooner in Maine who, rather than sitting back and demanding large PCs costing thousands, opted to scour yard sales and user groups for TI99/4As for her charges. Then, instead of locking the machines up at night in an empty school, Spooner sent the little critters home with a rugged computer under their arm! The young researcher who I drew kept asking questions about the school, the teacher, the exact address. When I told him the teacher had received a teaching award, he needed specifics. Then he told me why. The vice president was going to Maine, ostensibly on vacation during the Democratic Convention. The researcher's home was in Maine! All we got the following days were pictures of the vice president fishing, which fit into a lot of political agendas of non 99ers. But a Washingtonian knows that politicians never are on vacation. If any maniacs out there know of any vice presidential contact in the elementary schools about the TI99/4A, they can blame me and perhaps others who contacted the administration to clue them in on a great story. Thanks Ron!

But the story is not over yet. In spite of huge amounts being budgeted for computers and some highly publicized computer gifts by the major computer manufacturers, there is not a prayer that anything approaching even a single computer for every classroom in America will happen in this century, unless we do something about it.

I believe "Free Computers For Qualified Teachers" is the way. That is what Mid Atlantic 99ers (MANNERS) decided to call their program of getting donated 99/4A computers into schools. Early on, MANNERS members decided that recruiting the teacher or administrator able to deal with an influx of computer equipment was a key. In looking at this, these 99ers decided that not a single member was going to talk about computers teaching anyone anything. "Computers do not teach, teachers do" has become almost a motto as members explain the program to teachers, administrators, and charity officials around the area. The idea, in brief, partly inspired by Ron's TI Forum *Computer Shopper* article, is that the clubs in the Washington metro area will focus the attention of closet computer owners of the 99/4A on the idea of donating their computers and software to teachers who have agreed to take on the care and maintenance of these sturdy, versatile machines. The Mid Atlantic 99ers have set for themselves a goal of placing 10,000 99/4A computers in Washington, D.C. area schools, rehabilitation centers, hospices and other institutions. Members tell me they have now validated their original belief that laying our hands on the console and a video connection was going to be the easy part. One advantage that the 99/4A followers have over any other computer group is that we have more computers to give away! TI built up to three million 99/4As, and no one can imagine more than 400,000 of the machines are still in active use. Yet, no one burns a book or is willing to admit that he or she threw a computer away. Almost all of them are still out there. And every week, the active 99er community is joined by someone new, the third, even the fourth owner of a particular machine, often the first one to do more than open the box. Most active members have three or more machines.

Why is MANNERS undertaking a public service effort? To try to help alleviate, in their own area, what around the country is a national disgrace; over two million closet 99/4As while America is in an "educational crisis." The program is not trouble free. Nothing is. Some are quickly learning to avoid county computer system managers, at least at first. Most "computer coordinators" cannot stop talking about IBM and Apple compatibility, system wide software standards, local area networks and the like, long enough to even listen. However, do not be discouraged by the response you get from the "professional computer people" in the major school systems, because right down the hall is a teacher whom that professional has been unable to help with any kind of computer. Members assured me that the teachers showed up in satisfying numbers at the Capital Area Heath User Group Convention, where area 99ers were given a booth. In addition, the

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More Timex Sinclair
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Radio Shack keyboards searching for a slice of immortality—and then its just a series of countless memories until the heart and car motor hum again.

Quite simply, the Sinclair/Amstrad groups today would not exist without these periodic seminars (which are increasing in number nationally). They are an inexplicable barrage of renewed acquaintances, bonding, sharing of information and provide the inspiration and direction for us all. My hat is off to this years organizers and participants, for it is you that provides the cohesive fabric for our organization.

With football, ice hockey and modem season here, my infrequent check of the mailbox netted the new Amstrad PCW-8256 catalog from SOS Datamension. While some regard them as overpriced, others simply ignore price and order selectively, as they are virtually the only game in town.

What I did like about their updated catalog, was that it offered some serious business and utility applications. It has crossed all of our minds at one time, that we hoped we weren't being regarded solely as a "games-machine." The PCW-8256 is still growing.

Products I like were the Mini Office/Professional, an integrated package offering word processor, database, spreadsheet, graphics and communications packages. This lists for $79.95.

PlanIt, a personal organizer, offers tracking abilities on personal accounts, daily finances, and a phone/address database. PlanIt lists for $59.95.

The point is power. Products that are currently available here in the states are Desktop Publishing, a solid collection of challenging games, Astrology and Ancestry oriented programs, checkbook, cooking, clip art, relational databases, project managers, datebooks and more. Contact SOS Datamension for their catalog, 615 Academy Drive, Northbrook, IL 60062-2420. Or call 1-800-HELP PCW.

Space simply will not permit an overly detailed analysis of my trip to Europe. I will instead periodically offer that information throughout my upcoming articles. Please drop me your suggestions, tips and techniques, I value them. ●

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Give It Away
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search for teachers willing to take on 5, 10, or more computers actually uncovered both new sources of computers for the club and new members! Teacher stories of needs for simple instruction devices were heartwarming as they watched children playing with educational software at the PUG show. MSDOS shows are noticeably lacking in game software, and this worked to the group's advantage.

Sooner or later, school computer executives will wake up to the availability of these resources and figure out the "*Computer Shopper* way." At that point, there will be a "resource coordinator" who will work to take advantage of natural talent and resources within the school system. Hackers or people with those inclinations in the school system or PTA will get excited about using computers as teaching aids. Administrators need not be afraid to network into that eclectic crowd most computer teachers never get to meet, a user group, who are usually willing to give more help, free, than any maintenance contractor ever discovered.

How Do I Maintain This Beast?

Should you decide to develop a similar program, be prepared to repeat yourself two or three times when you get questions about maintaining the 99/4A. People do not hear you the first time when you tell them that the machine has a maintenance system better than any devised by a computer store, called a user group aided just a tad by secret weapons called *Computer Shopper*, TIFORUM on CompuServe, and Micropendium and other telecommunications networking tools.

MANNERS at this point is concentrating on teachers and other members of institutions who are unafraid of the bureaucracy and are willing to have some fun with a computer. As might be expected, you will be told by dozens of people, many of them non teachers, that there are many reasons your program cannot work. Oddly enough, you will also locate more computers to give away, along with picking up new members along the way for an assortment of reasons. As a result of talking about something positive, MANNERS reports acquiring about ten new members!

99ers have been noticing that teachers are beginning to make up a large percentage of our membership. Teachers, such as Jack Sughrue of MUNCH are very active and successful with our groups. This is really nothing new. Stan Veit and *Computer Shopper* have a famous relationship with people involved with the recycled computer. Stan recently featured a recycled Mac motherboard and fascinated his sophisticated readership. The orphan community is ready for more teachers because enough of them have found us and enriched our fellowship on their own! If your user group wants to share experiences and promotional materials with MANNERS, write them, enclosing a large self-addressed and stamped envelope, c/o Jim Horn, POB 4170, Rockville, Maryland 20850. Include a $16 check made out to MANNERS if you want their regular newsletter.

Pastor's User Group

Some of the schools that MANNERS will end up helping will without a doubt be parochial schools, ones looking for all the support they can get. Something else we need more of are groups that will take on the chore of specializing in some aspect of another of the numerous capabilities of the 99/4A, its enhancements and the Geneve and making their expertise available internationally. The Pastor's User Group (PUG) has taken on the responsibility of communicating with those to whom God is only a toll free call away. Anyone interested in membership is "cordially invited to contact the Pastor's User Group by writing to Drawer D, Hempstead, Texas 77445. There are no dues or fees at this time." Even with that being the case, their newsletter travels via first class mail, so I am sure the pastors would not mind finding a few first class stamps or even a generous check in the plate. They are over 50 percent non ministerial in make-up and all walks of life are welcome. The letter is distributed internationally and accepts ads.

UCSD Pascal Anyone?

One of the oddest little stories of the TI99/4A is the UCSD Pascal tale. When people read in the very first issues of *99er Magazine* (remember it?) that Pascal was just around the corner, many

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bought or expanded their machine on the prospect of having a computer on which to learn a coming new language, one that looked like it would replace COBOL. We could learn this language at home rather than struggle for time slots on mainframes (remember them?). As it turns out, BASIC is more important to micros, and COBOL is as secure as ever in the places where it is used. No one knew that then. I first learned about the UCSD Pascal operating system, called the p-System, from the breathless prose of *99er Magazine*. I was instantly convinced UCSD Pascal and the p-System would soon rule the world. I fired off a check to something called USUS, which stood for the UCSD System Users Society and started getting a newsletter called the USUS News and Report.

I also signed up for CompuServe about that time and joined something called MUSUS, one telecommunications arm of USUS and started bugging them and a lively fellow named Stan Veit over in a congenial area originally called the Popular Electronics SIG. MUSUS folks acted like I was an amusing critter from outer space with all my talk of the toy computer. Stan was more congenial, so I hung around there more. It turned out that TI did not believe in the UCSD System for the 99/4A very much either. The long promised UCSD p-System, first described before the 99/4A was launched, never got into the marketplace in quantity until TI cleared their warehouses in their 1983 fire sale. Even then, many UCSD cards turned out to be defective, probably one of the reasons their introduction was delayed in the first place. If you own a defective UCSD card, here is news you can use. Because of the early problems known to be the fault of TI, they maintained a generous policy of in kind replacement, and probably will do so even today if they have remaining stocks. If you have recent experience with UCSD card replacement, write to me, care of *Computer Shopper*. By late 1983, a lot of people's interest in learning Pascal had either dampened or had become a rationalization to move to a clone and to Borland's Turbo. Yet, like everything else they do, TI left a footprint. Today there is an active international 99/4A p-System community, with the potential not only to reach Pascal, but compiled FORTRAN, Modula II, and a compiled BASIC.

If You Enjoy Tear Jerkers, Ask USUS For The History Of The p-System

The tale of why most micros are using Borland's Turbo rather than p-Code will bring tears to your eyes. Indeed, one could argue that MSDOS and its associated multimillionaire, Mr. Gates are lucky, since the p-System had more than several years jump on MSDOS and looked more promising to many. If you join USUS you can get a detailed history. Ask for those issues of USUS News & Report. A sophisticated system awaits you out there if you care to explore it. The international community is still pushing this world to its limits. Jerry Coffey, author of Jump Boot for the Geneve also owns a "UCSD Micro Engine" and fires it up for guests from time to time. He is currently taking 99/4A Pascal programs sent him by Swedish 99ers and is enhancing the software for use on this side of the Atlantic.

Myarc And Pecan Muttering At Each Other

With any luck, the Geneve will also be running the UCSD system shortly, since Pecan Software of Brooklyn, the current owner of many of the central copyrights for the p-System will be making a driver for that machine. While there has been some muttering back and forth between Myarc and Pecan, hopefully that will be settled soon. All sorts of programs written for Apples, IBMs and even Stride powerhouses are available for execution or straightforward conversion through USUS. USUS programs are not public domain. While available very cheaply or even free at their twice yearly conventions on each coast, the programs are owned by USUS and their authors. With purchase of development software from Pecan dealers, Geneve owners can even start writing new applications that will run on Apples, IBM clones and others right from the start. The 99/4A system contains the development package. You can start learning how to program in Pascal right now with the requisite card and software for your 99/4A.

What to do? First, if you have a card and are no longer interested in it, sell it! Take out a classifed ad in *Computer Shopper*, or pass the word around the user group until you find someone who wants to take up Pascal. If you are a member of a telecommunications service like TIFORUM on CompuServe or TI RoundTable on Delphi, or GEnie or Source (did I leave any out?) by all means get rid of the card up there. Find it a new home. Do not forget to include the software, still under copyright. If you want to explore the UCSD environment, give USUS a whirl. Send $40 to USUS, POB 1148 La Jolla, California 92038. USUS recently discovered they have a large group of 99/4A owners as members. USUS is trying to help us develop and communicate with each other. CompuServe members can pop into MUSUS, even before joining, though non member access is limited. They normally trust you that your check is in the mail. There is an official 99/4A SIG in USUS. There is a nice collection of UCSD Pascal programs on TIFORUM on CompuServe which are public domain. Next, contact Jerry Coffey, who has been doing more than anyone I know inside and outside of USUS to help extend the 99/4A in the UCSD p-System world. Since I do not have his permission to let out his address right now, just write him and send the letter to me c/o *Computer Shopper* and I will make sure he gets it if you are not on the services he frequents. If you like you can put the letter in an envelope with his name on the outside. No stamp on the inside letter is needed. I can be reached on TIFORUM or via email or TELEX at CompuServe ID 76703,603. ●

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Atari-8 To Get 16 Bit Power

by John Nagy

Eight-bit Atari computer owners will shortly have the ability to upgrade to 16-bit processing without having to change machines! A user-installable upgrade will open the door to power and speed rivaling or surpassing the IBM and perhaps even the Atari ST—for under $100!

The "Turbo 816" by DataQue, for the Atari, will be available by mid November for a suggested retail price of $99.95 (probably discounted by most vendors). Included will be a circuit board that simply plugs in where your 6502 CPU now sits, and a replacement operating system chip to replace the Atari OS. (Of course it is a little less simple for those XL/XE owners who's machines don't have rockets —they must desolder their old chips and put in sockets.) A debugger for 16-bit assembly language programmers will also be included, and a complete Assembler may be offered either separately or with the package.

On the new five-chip Turbo 816 board is a powerful 65C816 processor that retains the 8-bit instruction set but has a full 16 bit set as well. DataQue (pronounced "da-tack") designers Ron Shue and Chuck Stienman have made sure that their design has "full" compatibility with existing Atari software, but include a "window" into a whole new world of programming possibilities. Discussions have abounded for several years about hackers who have tried alternative CPUs in their Atari-8 machines, but none before have been successful in providing the dual nature needed by most owners.

To quote the press release from DataQue: "The Turbo-816 will not only increase the potential speed of the computer, but also break the 64K memory barrier of the existing systems. Not with the awkward paged memory, but with a fully linear decoded address space of up to 16 megabytes. Benchmarks have put the Turbo-816 into a performance range above many of the "other" PCs/!! Special memory boards will be available to take advantage of the new extended addressing range. These will be mounted internal to the computer cabinet, and in most cases require no hardware modifications."

Chuck assured me that existing upgraded memory machines will be supported by the Turbo 816, no matter which flavor or size. Additional RAM expansion past the physical limits of the inside of the computer will be supportable in an eventual external card cage, as the Turbo 816 has its own 16 bit database. For most users, this will remain unused inside their machine, but for the adventurous, it can be brought out via a 64 pin edge connector and ribbon cable for additional uses.

Users of the new CPU system will see an immediate speed increase in all their existing 8-bit software. How much? Ron says "just enough to tell there is something different." The custom operating system chip has much faster I/O routines to all devices, making disk access, screen writes joystick response, almost everything faster. However, the actual "pace" of most software will be typically unchanged. This is vital, of course, for games and other timed-response or dynamically prompted applications. Overall, there will be a general responsiveness improvement. Additionally, the math is all being done with new routines that will dramatically surpass computation times of the "standard" system, making the normally numerically slow Atari actually useful for number-crunching.

Now, a speed increase of the (somewhat small) proportions offered to regular 8-bit software users probably just barely merit interest at the $100 cost level. But the real power of DataQue's device will be in the future applications utilizing the 16 bit mode. Machine code written for this mode will be 20% smaller and up to 20 times faster than that written for the "native mode" 6502. What is even better, designer Ron Shue has arranged for memory registers and stacks to "hold up" under a mode-shift, enabling a programmer to code half of his application in 8-bit mode, say to make use of existing CIO/SIO disk access, then shift to 16 bit mode for computation and processing—then back to 8 bit for more I/O—and on and on. Much like the memory upgrades, it will be possible to code a program to look for a Turbo 816, and if finding one in the machine, proceed with 16 bit routines, while retaining parallel (slower!) 8-bit code for use by "vanilla" machine.

As for the new operating system, as I mentioned it retains the vectors, flag, and entry points of the Atari OS, but is virtually 100% rewritten for optimized function with the new CPU. Included is a much improved floating-point package, a real resident R: device handler (no more loading that file called "R5232.COM" to use your modem interface), and room for lots of exciting things to come.

Again from the press release: "The future holds many more products for the Turbo-816 systems including:

1) a real-time multi-tasking operating system kernal

2) a new assembler-editor-debugger package which supports the new assembly level instructions and addressing modes

3) a new BASIC which will speed past the fastest of the current BASICs for the 8-bit machines

4) a new K&R compatible C development package

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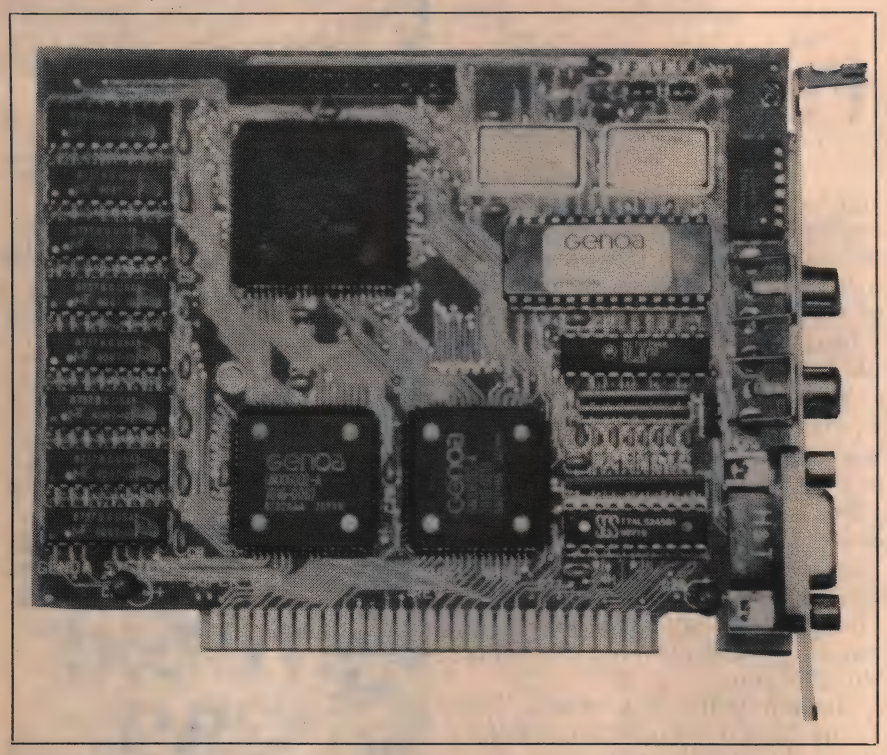

Genoa Releases Improved SuperEGA HiRes+ Board

Genoa Systems Corporation recently announced that they are now shipping the improved version of the SuperEGA HiRes+ 4880 enhanced graphics adapter. The product operates on any IBM-compatible system that is equipped with a multi-scanning monitor.

"The 4880 achieves 800x600 maximum resolution—a 114% improvement in resolution over standard EGA cards," said Larry Liang, vice president of sales and marketing. "The product is 100% IBM EGA compatible and fully compatible with all IBM color graphics and monochrome adapters down to the register level," he added. Other graphics/text resolution modes include 640x480, 752x410 and 912x480. The product automatically double scans CGA modes from 320x200 to 400 lines.

The 4880 graphics adapter has the smallest form factor of any comparable product—a less than half-length board that is 5.1"x4.2". It supports the full range of popular video standards, including EGA, CGA, MDA, Hercules and PGA resolutions. The 4880 has a 132x60-line display capability for greater spreadsheet visibility and supports all VGA modes (except mode 13) in 16 colors, with a 9x16-character box for modes 0+, 1+, 2+ and 3+.

High-resolution drivers are available for the full range of spreadsheet, Computer-Aided Design (CAD) and desktop publishing applications, including Windows, GEM, AutoCAD, Lotus 1-2-3, Symphony, Ventura Publisher, Framework, VersaCAD, OrCAD, Dr. Halo III and others.

For IBM Enhanced Color Display, all standard EGA and CGA modes are supported. For IBM Color Display, standard EGA modes 0-6, D and E are supported, along with graphics mode 320/640x200. For IBM Monochrome Display, monochrome text mode 80x25 as well as enhanced text modes 80x29/32/44 and 132x25/29/32/44 are supported.

Additional features that contribute to the SuperEGA HiRes+ capabilities are the card's proprietary custom chip set, which supports horizontal monitor frequency speeds ranging from 15.75 to 35.5 KHz. The chip's video bandwidth can operate at up to 40MHz for advanced applications in the CAD/CAM area. The product also offers a light pen interface, bitmapped graphics, loadable font, programmable cursor and 256KB of on-board memory.

For more information call or write: Genoa Systems Corp., 75 East Trimble Road, San Jose, CA 95131; (408) 432-9090; FAX: (408) 434-0997; TELEX: 172319. ●

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5) a new Turbo-GOS operating system (graphical based)

6) a developers development kit for new applications."

As some of you may realize, DataQue is also the company that offers "MTOS" the experimental 8-bit Multitask operating system for the Atari by Tom Hunt. While the "no free lunch" problem of trying to push multiple tasks through an already over-busy 6502 makes the current MTOS crawl, the Turbo 816 will allow a version of MTOS to literally fly. It will be possible to code a multi-task environment that could be part of the ROM operating system. Since the 65C816 requires no bank-switching to handle large memory access or memory moves, it could be possible to run four independent or interdependent images of your computer, each running a full-blown 64K program within a 256K upgraded Atari! Yikes!

By the same token, a graphics operating environment like Alan Reeve's Diamond, could be optimized for much speedier and versatile 16-bit operation and included in the ROM. (An aside, Diamond was still not ready for release at this September writing, but beta versions sent to DataQue for testing run fine on the Turbo 816. Reevesoft is now teamed up with Merrill Ward, who have dropped their similar graphics environment "ST Jr." due to reported difficulties with its developer. Diamond is shaping up to be a major project that will far surpass Commodore's GEOS system. Look for more about Diamond in the next *Computer Shopper*!)

Any number of things can be "inboarded" in the operating system chip. Even Spartados X could be revised for 16-bit operation and licensed for use!

More about compatibility: Ron Shue has bent over backwards to be certain that Spartados, Real-Time-Eight, MIO (all products of third party Atari product leader ICD/OSS Inc.), and hard disk users will have no ugly surprises after adding the Turbo 816. Only a tiny percent of programs (only some using illegal updates or unauthorized hardware address hopping) have had problems with the new operating system. Chuck Steinman says that later upgrades in the operating system chip will be offered to all users at virtually postage costs, and Ron is expecting to offer a piggyback system software control, for those who want to be able to shift between their old chip and the new one. This would specially interest anyone with custom OS chips already. (The Omniview or Omnimon chips from Newell Industry, for example.)

DataQue is looking for qualified developers to be the first owners of Turbo 816, and are looking for ways to add incentive for rapid application development. As it is with all new hardware, there is no software available to make it really shine. Ron hopes that within six months of introduction there will be enough output in the public domain from the early developers that everyone

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GFA Basic
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Sound Edit program, a simple processor which allows room for experimentation until the desired effect is achieved.

Input/Output functions are drawn out in broad relief via study of Dumb Terminal and Easyterm, telecommunication programs. One can hardly wait to apply these principles communicating with disk drives, printers, and modems.

Finally, Appendices include separate sections on BIOS, GEMDOS, and XBIOS functions. This book has the clearest explanation of this material we have seen to date. Much like the "ST Internals" by Abacus, Sally calls this section "The ST Internals for GFA Basic."

These sections contain brief explanations of each of these GEM functions as they apply to GFA Basic. Again, it's not Miller's intention to provide a complete guide to using the functions, but simply to provide the necessary parameters for executing functions in GFA Basic.

Chapters 3 through 6 feature program examples that are quite long. These programs are in ASCII (*.LST) format so they can be easily merged into GFA Basic Interpreter for closer examination and experimentation. Routines can be taken from these to add to your own programs.

MichTron has made an optional disk available to spare programmers hours of tedious effort.

This disk has been marketed separately to keep the book's price more affordable for those willing to do their own typing.

Miller strongly suggests purchasing the disk, however. It is far too easy for typing errors to slip into such long files.

The disk is available for $12.95.

Errata

If you get a syntax error when using the Sound Editor, do a global replacement of the variable WAVE$. Any other new variable name should work. This bug may not be in the release disk, but my beta copy had this problem until Miller pointed out he had mistakenly used a command name as a variable.

Errors are bound to occur in any massive work like this, but as MichTron's Director of Technical Support, Miller promises to do something more about it. He promises more product support. It is his goal in this year to strengthen MichTron's image with friendly after the sale service including personal availability for technical answers and errata sheets.

Summary

Running out of shelf room due to all the GFA Basic books you've collected? Put the BFA Basic Manual in mothballs. You won't need it now, except for ASCII codes, which is the only thing we noticed missing from Miller's new manual.

Miller desired to develop an even more complete reference in one book, but all of us will have to wait for Volume II to see the good stuff he was forced to put aside until later.

Miller certainly gives depth to the broad picture in what he has covered; everything from graphics and simple animation, to the use of sound and input/output functions within programs. Alert Boxes and Menu use is modeled within each utility. Programmer grasp of them can't be far behind. These details will provide final substance to many new creations just waiting to take shape.

In our interview, George Miller mentioned a gap he saw in his graphics section. Since writing the book, he has found areas that seemed obvious to him are not so obvious to others. "If I had it to do over again, I would have cornered more of the tips and tricks of the trade," he said.

What about Volume II filling these gaps? At this time, he doesn't plan to backtrack over previously covered territories, but rather explore the tremendous capacities of the new 3.0 version of GFA. It has 10 times the power of 2.xx, he claims.

Since MichTron did not shrink-wrap Volume I, you can browse through it at the store to prove it to yourself that this is a programming aid you will not want to be without.

Wow! And all at the surprisingly low price of $29.95!

GFA BASIC Programmers Reference Guide, Vol. I should prove to be a long-standing resource. Miller promises continued support for commands already established. He says these "old" commands will remain standard and unaltered by updates and additions to GFA BASIC.

Volume II and any other future volumes will be devoted to GFA Basic Interpreter Version 3.0, which is said to have many added commands (and, unbelievably enough, 10 times the power).

Be on the lookout for GFA Basic, Version 3.0, which was to be released the end of August.

Volume II of the Reference Guide (yet to be written) is expected to be finished and released in 1989.

While Miller hopes for a release early next year, he admits not much is going to happen on this spare time project as long as the weather stays this hot.

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will want a Turbo 816 in their machine.

What does Atari Corp say about all this? Well, Ron has been in constant contact with Atari throughout his development of the project. Fearing a blockade similar to that which delayed the "ST Transformer" 8-bit emulator by Darek Mihocka, Ron has been careful to get clearances from the (now more flexible) corporation. Atari has been generally supportive and helpful thus far, although DataQue is still waiting for written clearances on their operating system. Even though it differs almost entirely from the Atari OS, it is just good business to have that aknowledged on paper before you sell enough to be sued over.

Ron had even hoped that Atari would be interested enough in the project to consider incorporating it in new production XE computers, but no such luck. At least one Atari official sniffed, "Why would we want to redesign the 8-bit machine to be competitive with our own ST anyway?"

Why not? Look at the Apple IIgs! It uses the same architecture that the Turbo 816 brings to the Atari, with results we can look forward to matching. Expansion boxes may allow alternative video options, new graphics modes, RGB, TTL, or Analog Monitor outputs, co-processors (maybe even IBM and ST emulators using the real 8086 and 68000 CPU, with full or increased speed over the original machines!).

If you detect some enthusiasm on my part over this product, it is because the options and possibilities are unlimited. This may be the opportunity for the faithful 8-bit Atarians to have the power and speed that has made them long for an ST, Amiga, or IBM, but with perhaps unrivaled flexibility and growth.

Developers and other interested users can contact DataQue at 3306 Bank Avenue West, P.O. Box 134, Ontario, Oh 44862, or online at Chuck's BBS "Master 800," at 419-529-5197. Both Chuck and Ron will answer mail online. Also, Ron can be reached via GEnie address "R.SHUE." and Chuck is on DELPHI, GEnie and CompuServe as "DataQue."

Ron also recommended that potential developers read *Programming The 65816* by David Eyes and Ron Lichity, 600+ pages available from Prentis Hall Press. Ron says it was invaluable in designing and setting standards for the new operating system, and provides all you will need to begin programming on the Turbo 816.

Don't miss next month's *Computer Shopper* for more details of how the "dead have arisen." Keep on eight-bitting! ●

DataPerfect Introduced By WordPerfect

WordPerfect Corporation announces the release of DataPerfect 2.0, a structured relational database program. DataPerfect's menu-driven definition scheme, large data capacity, powerful formula processor, compatibility with other WordPerfect Corporation products, and help feature, make the program an important addition to PC database software.

Defining a database—often a laborious, time-consuming process—is simplified with DataPerfect's menu-driven definition scheme. The menu system is logical and easily followed, cutting database definition time from weeks to a matter of hours.

While other database programs require the developer to use network commands to define network operation, DataPerfect handles this automatically. As soon as a database structure is defined, it is ready to run on a network where many users can view, enter, and modify data in the same file(s) simultaneously.

DataPerfect supports a text storage capacity of up to 510 million bytes, with data file sizes of over 2 billion bytes and more than 16 million records. Each database may have up to 80 panels and each panel may have up to 80 fields. Despite the large storage capacity, each index is kept small and fast with DataPerfect's index compression feature, making cross referencing less complicated.

Formulas may be used to initialize field values, calculate a field value from other data, manipulate dates, and validate fields. Operators and functions can be combined in a variety of ways to build more complex formulas. Mathematical operations include addition, subtraction, multiplication, division, mod, and forced negation. Nine logical operators (such as And, Not, and Or) are included for value comparisons. If and Case statements can be used when applicable.

DataPerfect's help key offers assistance from several levels: information on the feature currently being used, labels for the function keys, and a list of DataPerfect's features and where they are found. Additional help information can be added by the designer of the database to give the user specific instructions for each application. For example, a help message could be created for each field in a record to assist the user in entering the required information. This feature also reduces the printed documentation necessary for DataPerfect applications.

Current users of WPCorp products—WordPerfect, PlanPerfect, and WordPerfect Library—will like DataPerfect's compatibility, allowing the user to import records in either delimited text or WordPerfect merge format. With the WordPerfect Library Shell program, database information can be stored in the clipboard, then moved into DataPerfect records or other programs. Data from other programs can be easily retrieved from the clipboard as well.

DataPerfect runs on the IBM PC, XT, AT, Personal System/2 computers, and close compatibles. DOS version 2.1 or higher and 192 Kb memory are required. DOS 3.0 or higher is required for DataPerfect to run on a network system. As long as a network supports the sharing and locking commands of DOS 3.0, there are no other special requirements. Supported networks include 3Com 3+, 3Com EtherSeries, AST-PCnet, AT&T StarLan, Fox 10Net, IBM PC Network, NOKIA PC-Net (Europe only), Torus Tapestry, and Novell NetWare (version 4.6 and higher). DataPerfect lists retail prices of $595 for the initial copy/file server and $495 for five subsequent network stations or five run-time only licenses.

A run-time version, for using predefined databases, will be available soon after the initial release of DataPerfect. The run-time version will not have database definition capabilities, but will have password protection for files and fields.

DataPerfect software comes with manuals for both the definer and user of the database. Each manual includes a tutorial, which introduces DataPerfect's features, and a comprehensive reference section. A color-coded template and Quick Reference guide are also included to give easy access to basic functions. If assistance is needed in addition to the manual, DataPerfect's toll-free customer support is available.

For more information about this and other WordPerfect Corporation products, call Information Services at (801) 225-5000 or write 288 West Center Street, Orem, Utah 84057. ●

LTI Softfont Disks Provide Font Styles

Laser Technologies International, has announced the LTI Softfonts library of downloadable HP-format fonts for the HP LaserJet Plus, Series II and compatible printers, designed to give laser printer users variety in font styles at an affordable price. The LTI Softfonts library consists of over one-thousand high quality fonts. Immediately available are two Specialty Font disks providing a unique collection of fonts, in a variety of sizes similar to the popular faces used in today's publishing, for a suggested retail of only $89.95 per package.

LTI Softfonts are used by many desktop publishing and word processing programs, including Ventura, PageMaker, Laser-Set, Microsoft Word, WordPerfect, and WordStar 2000 Plus Release 3, on all IBM PC/XT/AT or compatibles using DOS 3.0 or above.

The Specialty Font disks are designed as sets. Disk number one includes 14 text and book fonts similar to Helvetica, Roman, Bookman and Optima ranging in size from 8 to 30 point. Disk number two includes 12 title and display fonts similar to Helvetica, Roman, Bookman, Olde English, Broadway, Park Avenue, University and Cooper, ranging in size from 12 to 30 point. For the users' ease and benefit each Specialty Fonts disk contains a simple download program, generic width tables for word processing software, and width tables for Ventura and the GEM environment (.VFM files).

LTI Softfonts Specialty disks are an excellent value, providing substantially more fonts per dollar than font cartridge alternatives. LTI Softfonts are available from your local software dealer. For more information contact Laser Technologies International, 5503 17th Ave. NW, Suite 577, Seattle, WA 98107; (206)784-4400; 15403 E. Alondra Blvd., La Mirada, CA 90638; (714) 739-2478. ●

Cover To Cover

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being published each year, it is important to present your subject with a new slant, an original outlook, and a useful form. Think long and hard about it. Then go down to your public library and research your idea. See what books are already on the shelves. Just because there are a dozen titles already covering your subject matter shouldn't, alone, dissuade you from writing on it. It just means that others agree that the subject is worth discussion. But it should be taken into account. The single best test is to look up your subject matter in Bowker's *Books in Print*. R. R. Bowker (245 W. 17th Street, New York, NY 10011) serves as registry for publishing worldwide. They publish several encyclopedic tomes annually which list books planned and already printed by subject, author, and title. Your local bookstore should also have copies. For the modem users out there, Bowker's listings are also available in electronic format on several database services.

Once you have decided on your topic, do two things. First, write an advertisement for your book. How will you sell it? What do you want to be able to say to your prospective buyers about the book? By writing the ad first, you will get a first idea of what direction you want your writing to take. Second, spend some creative energy on your title. Make your book title sell the book. A good title is in two parts—the main title, and a secondary, explanatory "pitch" line. For example, for a book on fitness, rather than "Total Fitness" why not "A Couch Potatoes Guide to Fitness—Starting For and Reaching Your Healthy Self." You cannot expect to sell many books as a new author with single-word titles as Stephen King can sell with *Carrie*. But you have to tell people what the book is about.

Gathering Your Tools

The biggest decision you will have to make with your book publishing idea is what software tools you are going to use. It used to be easy. Are you going to use PageMaker (Aldus Corp., 411 First Ave. S., Suite 200, Seattle, WA 98104; (206) 622-5500) or Ventura Publisher (Xerox Corp., Xerox Square 014B, Rochester, NY 14644; (716) 423-1343)? These were the only choices offering the features needed to output a document suitable for book printing. Those features included:

—laser printer support and multiple fonts and point sizes
—graphics and text importing from other packages
—columns, automatic text flow
—automatic hyphenation
—automatic page numbering, index generation, table of contents, and footnoting
—variable kerning and leading

Now, as choices and prices have a wider spread, you have some serious decisions. It is always perilous to make blanket statements, but I have to. I cannot recommend any of the "low-end" (under $200) software packages. They just simply cannot do the things necessary to get your book out. These packages might be adequate for a 4-page newsletter (which is what they were designed to do), but not for a publication of any length.

There is some leeway in the middle-to-high range, however. "Byline" (Ashton-Tate, 20101 Hamilton Avenue, Torrance, CA 90502; (213) 538-7345; $295) has most of the features you need. It does not do hyphenation or generate an index, table of contents, or footnotes. But, with a little extra work to do these tasks manually, it might be worth the money saved if you are on a budget. Byline is one of the very few desktop packages that does not support (or need) a mouse and will work quite adequately without a hard drive. Another middle-range package is "GEM Desktop" (Digital Research, Box DRI, Monterey, CA 93942; 800-443-4200; $395). Desktop is strong in graphics and text importing and has an easy interface. But, like Byline, it is a little light on other text features. No footnotes, indexes, etc. It does leading with 1/100" increments, but does not support kerning.

Another "new" option is using a word processor for your desktop publishing. The new editions of Word Perfect (Version 5.0), Microsoft Word (Version 4.0), and WordStar Professional (Version 5.0), have incorporated a number of the features previously found only in the page-output packages. It makes sense as well because you will be typing in your text using a word processor anyway and then importing it to your page-layout software. With these new versions, you can incorporate graphics,

continued on page 562

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Building Information Systems With An Expert

Scott, Foresman and Company's new book *R:BASE For The Programmer* provides expert guidance in building information systems that work elegantly and efficiently. Best selling computer author Nelson T. Dinerstein demonstrates how to analyze problems, design solutions, and write custom programs with R:BASE for DOS and R:BASE System V.

R:BASE For The Programmer explores all of R:BASE for DOS and R:BASE System V's important features. Sample programs illustrate important topics and give readers an opportunity to develop solid programming skills. A complete sample sales, inventory, and billing system is included.

R:BASE For The Programmer supplies a wealth of essential reference material, including coverage of the usage and syntax of R:BASE commands and statements. Tips on efficient file and program design and solid programming and debugging techniques make this book an ideal resource for programmers who want to learn to work smarter.

R:BASE For The Programmer
by Nelson T. Dinerstein
July, 1988, $21.95
ISBN: 0-673-38158-7 ●

New Book Makes Lotus 1-2-3 As Easy As ABC

Scott, Foresman and Company has just published the Second Edition of its best seller *The ABCs of Lotus 1-2-3*, by Bill Kling. Revised and updated with information on Lotus Releases through 2.01 and HAL, this edition has the clear, simple directions, meaningful practice exercises, and helpful illustrations that made the First Edition so popular.

With its unique building-block approach, this book will help even beginners quickly become proficient Lotus 1-2-3 users. *The ABCs of Lotus 1-2-3*, Second Edition, guides the reader step-by-step through computer and Lotus fundamentals including 1-2-3 Help, Edit feature, and files. Readers will progress from the basics of spreadsheets, graphics, database, and printing through advanced concepts and features such as macros, data tables, and lookup tables.

The ABCs of Lotus 1-2-3 also provides a number of truly helpful appendices, including lists of 1-2-3 commands and their syntaxes, 1-2-3 functions and macros, and a guide to HAL.

The ABCs of Lotus 1-2-3, Second Edition, by Bill Kling. Published July, 1988, $19.95 suggested retail price, ISBN 0-673-38123-4. ●

Computer Book List continued from page 283

be the main vehicle for data transmission until the mid-1990s, when ISDN could become the dominant transmission vehicle," Daniel Janel, CompuServe On-Line Edition. This book will certainly tell you about the modem, and besides all this, it's dedicated to Stan Veit!!

Xenix At Work
Woodcock and Halvorson
Microsoft Press
$21.95
Pages: 418
Copyright: 1988

Whether a new Xenix user or system administrator, this book from Microsoft themselves, should provide a wealth of information. Covers the vi editor, nroff text formatter and ways to communicate with others on the system.

IBM PC Advanced Troubleshooting & Repair
Brenner
Howard W. Sams
$24.95
Pages: 286 Trade
Copyright: 1987

Written especially for intermediate to advanced computer technicians, students, and hobbyists, it goes beyond existing documentation and technical manuals to provide the most up-to-date techniques for quick and easy troubleshooting and repair of the IBM PC. This book is the perfect companion to the *IBM PC Troubleshooting & Repair Guide and IBM Model 5150 Computerfacts.* An in-depth description of the PC system operation, techniques, tricks, and tools of the trade, troubleshooting programs, etc. is given.

Inside OS/2
Gordon Letwin
Microsoft Press
$19.95
Copyright: 1988

Gordon Letwins' *Inside OS/2* is a result of his programming experience and in-depth knowledge gained as chief architect of OS/2. The book features OS/2s' graphics, architectural design, as well as a discussion of its weaknesses and strengths. Lets face it—if you want to know about a subject, the closer to the source you can get, the better—right? How much closer does anyone have to get than the chief architect of the whole project?

dBase IV SQL User Guide
Hursch & Hursch
Ashton Tate
$24.95
Pages: 400
Copyright: 1988

This book should help the users new to SQL [and there will be many of them!!!] to quickly come up to par using the powerful SQL features in dBase IV. For intermediate-level dBase users with "dot prompt" experience, this book will be most useful. Also available *dBase III + To dBase IV: The Language Bridge Book By Adam Green* [$24.95] Due out November, *SQL: The Complete Reference* [$24.95 Tentative]

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columns, WYSIWYG (What You See Is What You Get) modes, headers/footers/indexing, and output to lasers. You may not have everything the dedicated layout software offers but, if you already know WP or Word, you are a step up on productivity.

What you finally end up using should be dictated not so much on price, as it is on features. You cannot pinch pennies here and shouldn't. You can cut costs elsewhere but not on what you use to output your book pages. I strongly recommend looking at Ventura Publisher or Aldus PageMaker.

Hardware

While speed is of the essence with these heavily-graphics oriented packages, virtually all will work with a standard PC. You will have time to have several coffee breaks when you reformat large documents on such a machine, but you can get it done—eventually. No need to run right out and buy an AT or faster machine. Hopefully, you do have a hard drive and color monitor but, again, you are not totally dependent on that. You do need at least a Hercules graphics card, 512K memory and, with most, a mouse.

I don't own a laser printer. Yet. But I have produced a complete "camera ready" book that was sent to a printer ready to simply photograph and print. Don't run out and buy one right now unless you have the budget for it. You can, as I did, output preliminary pages on a dot-matrix printer and, when you are satisfied with the general layout, refine them on someone else's laser. Medium-sized cities and larger often have several businesses catering to self-

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FLOPPY DISK DRIVE $19.00

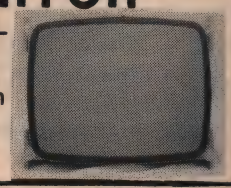
SEIKO 8640 FULL HEIGHT– 640K–
These drives are NEW and sold AS IS. 400 in stock. May require special software or other technical assistance to make them work. We have no manual or technical assistance for this product.

40 Mb Full Height HARD DRIVE $225.00

QUANTUM 540 – 51 ms access time

CDI 12" GREEN MONITOR $39.00

NON-ENCLOSED – HIGH RESOLUTION – TTL
-Horizontal sync: 15 to 32 KHz
-Vertical sync: 47 to 63 Hz (80 Hz optional)
-Vertical Performance: 1200 line center resolution
-35 MHz within 3db bandwidth



CONRAC 19" COLOR MONITOR $1,200.00

7211C19 (Originally $4600)
-Resolution: 1080x809 –
Bandwidth: 100 Hz to 40 MHz
-Scan Rate: 15,750 to 36,750 lines/sec interlaced or non-interlaced
-High and Low input impedence

3 Megabyte Floppy Drives $25

(Amlyn or Kodak Mfg.)-Runs with AT type or 8" HD Controller--KODAK has 160 tracks, 17 sectors per track. AMLYN has 154 tracks, 15 or 16 sectors per track. It is 2.35 or 2.6 Mb formatted. Can read 360K disks. Requires 50 pin, 8" cable.) -Standard 34 pin floppy drive interface - Controllers available for XT or AT add on to 4 floppy drvs. -Program and file compatible, requires driver software. (505)579-4496.

KIT PRICE: $129.00 DRIVE,CONTROLLER, SOFTWARE,1 MEDIA DISK Technical Assistance

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Great source of optical and electro-mechanical parts and systems including the basis for an infrared communications system. Contains f1.4 - 12 to 72 mm (6x) zoom lens with auto focusing capability. DC motor driven or manual zoom and focus systems with precision gear reduction units, mechanical clutches, and high quality DC motors. DC rotary actuator controlled iris diaphram unit. Option Available: Infrared distance measuring system (focusing unit) with control electronics $10.00.

TAPE BACKUP CARTIDGES--
DC300 XIDEX $10.00 (2 pc. minimum)
DC1000 No label $5.00 (4 pc. minimum)

FULCRUM TRACK BALL $89

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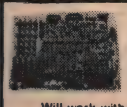

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ADAPTEC 4000A SCSI Controller $60.00

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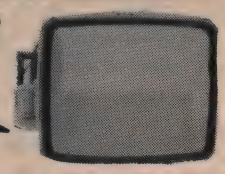

POWER SUPPLY BLOWOUT! $12.00

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Please check dimensions. These are open frame supplys.

188 Watt Switching Power Supply.

On/off switch in the front. Built in filter for easy power cord plug-in. Open frame, L-bracket type. Two 4-pin power plugs for floppy and/or hard disk drives.

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Dimensions: 13½L X 5½W X 2¾H

***Compower 130 Watt supply.** Unit is open framed.*

Output: +5V @ 5A, +12V @ 5A, -12V @ .5A
Dimensions: 8½L x 4¾W x 2½H

***Power Systems — 180 Watt supply.** Unit is open framed with 2 four pin power connectors built onto the unit.*

Output: +5V @ 20A, +12V @ 4A, -12V @ 5A
Dimensions: 9¾L x 4⅜W x 2½H

THE RETURN OF THE SPY IN THE SKY $39.95

NEC UPD791D — (CHARGE COUPLED DEVICE) 4096 ELEMENT — LINEAR IMAGE SENSOR

The charge coupled device is soldered to a pre-amplifier board. (We sold out of the A/D board that accompanied the unit . . . They went fast!) Since this is an analog device, the circuitry to provide timing signals and convert analog outputs to digital MUST BE SUPPLIED BY THE PURCHASER to interface to a microprocessor based system.

Timing requirements could be determined from a NEC manual on the 791D or from the schematic on the A/D board. PLEASE NOTE: We have the A/D board schematic, but unfortunately, we do NOT have the NEC manual. Designed for page scanning applications including facsimile. (Optical character recognition and other imaging applications which require high resolution and high sensitivity)

10 Milliwatt-Helium Neon LASER TUBE $99.00

NEC 5261 (Same as 5260)
10 Milliwatt (Max Output)–5 Mw (minimum)

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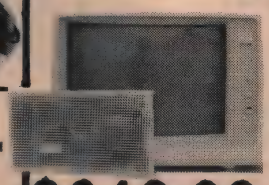

Possible Display Modes VGA Graphics:
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EISA May Make
continued from page 308

mance microprocessor. Notably, there appear to be similarities to what Compaq appears to be proposing.

Works Like A Micro Channel

The Compaq clone-clone bus lays claim to similar attributes and reportedly will act like the Micro Channel. However, it appears that the Compaq implementation is geared solely to Intel processors and will be bandwidth limited to about 35-40MHz. The original PC/ET design had the same limitation (recent tests at WGL indicate a cutoff operation of 27.4MHz for various implementations of the so-called standard AT bus). In comparison, the IEEE 1196 Nubus 32-bit specification limits the bus to 37.4MHz of bandwidth. The latter can be upped in performance with new timing and faster parts. The AT and now EISA have fundamental transmission characteristics that make boosting the bandwidth difficult and expensive to implement.

In contrast MCA appears to support an 80MHz bandwidth, thus making it a more compelling base for high-speed processors. The MCA is mainly being used for Intel processors, but wasn't designed with a given processor in mind (the core technology is based on Computer Automation's method of CPU to memory transfer). This becomes very important when byte ordering and transfers are considered. Moreover, operating system writers end up with interesting problems when they have to worry about the way a processor is handled by the bus. The goal is to have a processor independent bus. The Nubus and MCA are, the Compaq clone-clone bus isn't.

To make the EISA approach work, Compaq has asked Intel to develop the necessary logic called the 82350 chip set. This set of chips manages the message transfers across the levels of the bus, does address translation and establishes when a transfer is being done and in what direction. Presumably the 82350 will also have the task of managing the protocol for board IDs. This chip set doesn't currently exist. The belief is that it is being patterned off the MCP chip set for Multibus—a bus structure that is now in severe jeopardy. The 82350 chip set is expected to be available sometime in late 1989. In the meantime, EISA implementations will have to be done with PALs and TTL.

The board ID is expected to act similar to that used with MCA. Thus a board will announce itself to the system. A non-ID board (the existing universe) will presumably be able to co-exist.

Right now the EISA is a Compaq offering. Other clone makers are claiming support. The question is, will they? None of the companies listed have licenses and may be feeling the pinch of declining sales, especially for high-performance machines.

Obtaining the EISA specification, it's premature to call it a standard, is via an unusual path. It's necessary to contact the law firm of Bishop, Cook, Purcell and Reynolds at (202) 371-5920, facsimile number (202) 371-5922 and request the EISA specification. They will send you an agreement and you send $2,500. I have tried to order the spec but so far I have been told that the response is so great they haven't been able to get to my request.

The wording of the agreement is interesting due to its restrictiveness. It makes it clear that EISA sprang from the head of Compaq's Rod Canion, much like Athena the goddess of wisdom who sprang from the head of Zeus. As such you pay not in terms of licenses or royalties but that you turn all rights of your inventions over to the consortium or is it Compaq.

More interestingly only manufacturers can get copies of the specification. Apparently the term manufacturer is very narrow and only applies to system box builders. A card manufacturer can't get it, or can they? Right now it's unclear.

A Nu Approach

Interestingly, AST is a surprising member—and it is unclear if they really are. AST has, in my opinion, taken the wisest approach by marrying the AT bus with the IEEE 1196 Nubus, an approach not lost on the IEEE. Indeed it has been a prime consideration of the IEEE 996 committee.

This AT to Nubus is a compelling solution since it makes it possible for two supporting market segments to have a new platform to sell boards to. Additionally, at least for the Nubus side, there are no restrictions due to patents or licenses.

An even better approach is to use Nubus as a high-performance platform. You can expect to see workstations coming from DEC, Sun, eventually Apollo and probably Apple and IBM that use Nubus. This bus is non-restrictive to the type of processor and lends itself well to RISC (Reduced Instruction Set Computer) technology. The new 80486, to

continued on page 566

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Complete 60 Meg AT SYSTEM

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Cover To Cover
continued from page 562

publishers. In them, you can rent time on a computer and a laser printer to print out the final pages of your book. Even smaller cities (such as mine) have a computer dealer with a laser printer who will probably rent you time on their machine. Since my book was on computers, I simply offered the owner 25 copies of the book ("a $250 value!") if he would let me print out the book on his laser. Barter lives. Try it.

Input Requested

That will do for the first installment. We have a lot farther to go. In the coming months we will discuss using several of the software packages mentioned, keeping track of your research with database software, using databases and mail-merge to generate your sales campaigns, how to choose a printer for your masterpiece, and other resources and legwork to get done on the road. I need your letters to guide me as well. If this column is or is not suiting your needs, let me know. If there are additional topics you would like to see covered write. You can reach me at the *Computer Shopper*, P.O. Box F, Titusville, FL 32781. I look forward to hearing from you and of your progress.

Resource Box: On our journey, we are going to list several sources of additional reading for the topics covered in each article. Perhaps the two best general references on book publishing is Dan Poynter's *The Self-Publishing Manual* (Para Publishing, Box 4232, Santa Barbara, CA 93140; $14.95) and Tom and Marilyn Ross' *The Complete Guide to Self-Publishing* (Writer's Digest Books, 9933 Alliance Road, Cincinnati, OH 45242). They are must reading for those serious about getting a book from disk to ink. Write to COSMEP (Committee of Small Magazine Editors and Publishers, Box 703, San Francisco, CA 94101) and request a sample of their newsletter and membership information.

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The Big Watch: A Review Of The Kodak DataShow

Reviewed by Ron Albright

If you have ever tried training a group on how to use a computer, you know the problem all too well. Whether you are teaching how to use Word Perfect 5.0 or how to publish a newsletter with Ventura, you have to make some hard choices about how you are going to accomplish the instruction. Are you going to use slides? Are you going to restrict the class size so that the attendees can all huddle around a monitor to see how things are done? Are you going to produce a video session? Each method has obvious drawbacks. Slides are static and, while they can be used for a large group, they do not show the real software-user interaction and cannot be modified to handle questions from the class. Restricting class size and watching a monitor resolves that problem but even with the new 19" monitors (costing several thousand dollars), you are hard-pressed to accommodate more than 5 or 6 students without a lot of eyestrain. Since you have to cut down class size, you may find yourself teaching the same class 10 times to get the job done. Videotape presentations work with that problem but, again, are static and hard to adapt to student questions. What's a trainer to do?

The Kodak DataShow eliminates virtually all the problems of teaching computer applications. One of a new genre of hardware products, the DataShow allows one to present a dynamic display just as you would see on your computer monitor but in a size large enough to be seen by a large group. The technology is simple enough. The DataShow serves as auxiliary screen which can be placed on an overhead projector and displayed in virtually any size your standard overhead projector can produce. Then, as you interact with the software (or hardware) you are demonstrating, it is shown on the big screen without having to have 15 people crowded around a single 9" screen.

Crystal Magic

If you have bought a watch or a pocket calculator, you already know what makes the DataShow work. It is based on the ubiquitous Liquid Crystal Display (LCD) technology behind all sorts of modern displays. The LCD is placed between two panels of glass. When your computer is connected to the device, the pixels of the LCD are energized and produce an image. When the light of the overhead projector is passed through the LCD, the "turned on" pixels produce a black-on-white replica of just what you would see on your computer monitor. With the DataShow (Figure 1 on page 566), the technology is taken one step further. To maximize the resolution, the LCD is "supertwisted" to enhance contrast between the screen and image. The Kodak DataShow was one of the first of these devices to offer a supertwist screen.

There is really nothing magical about hooking up the DataShow. It comes with a permanently attached 6 foot cable that ends in a medussa-like collection of connectors (Figure 2). First, there is a standard 9-pin female RGB connector that attaches to your computer's monitor port. Running off that, there is a 9-pin male connector that couples with a conventional CGA monitor if you want to run one with the LCD display. It is not imperative that you do. Second, there is a circular DIN connector that plugs into an external power supply. Finally, there is a 25-pin RS232 plug. This allows for a remote control to input to your computer. More on this later. Once hooked up, the rest is simple. The DataShow is placed on a regular overhead projector and, then, whatever your monitor would normally display, the DataShow presents on the "big screen." The device has a resolution of 640x200 pixels and any text or graphics that can

continued on page 566

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8	Qube-Calc	#696	"Lotus compatible 3-D spreadsheet"
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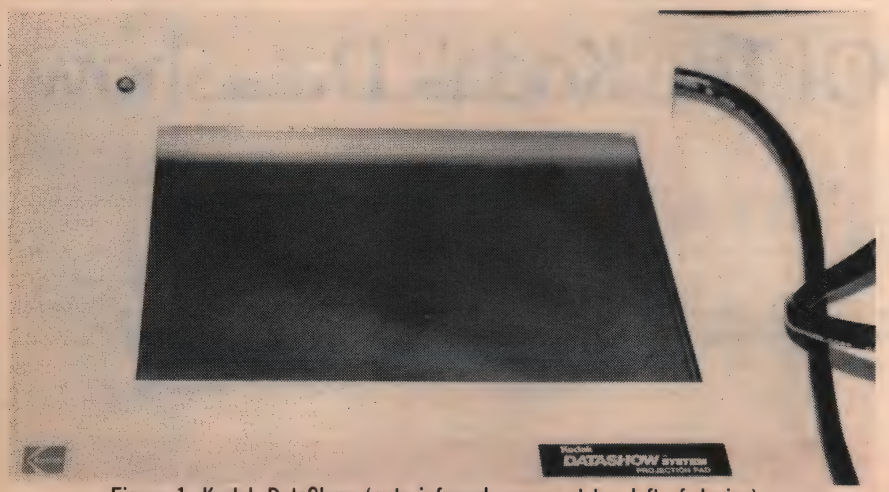

Figure 1. Kodak DataShow (note infrared sensor at top left of device).

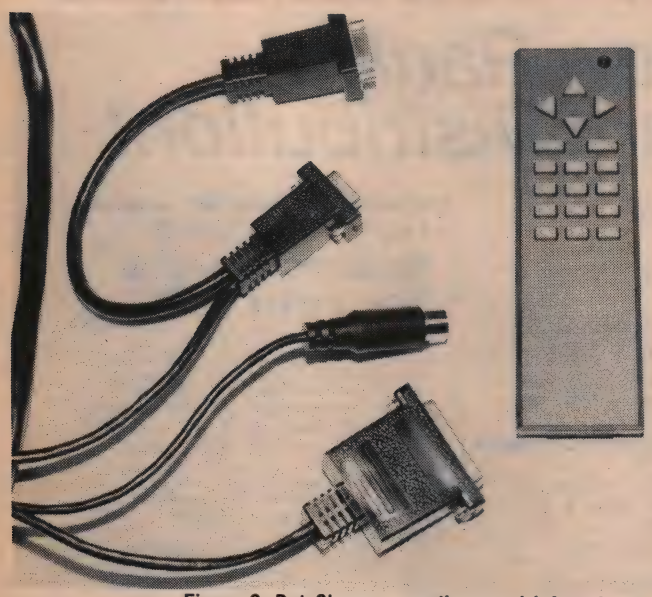

Figure 2. DataShow connections and infrared controller.

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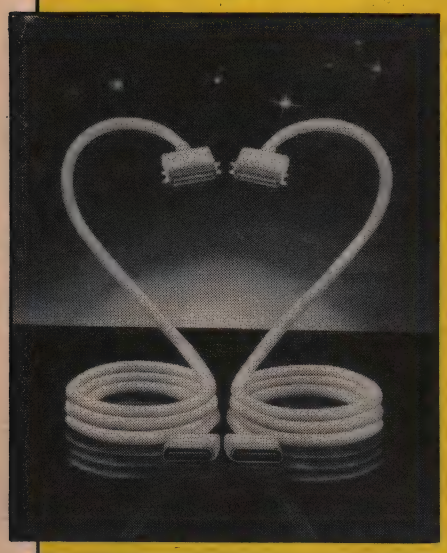

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The Big Watch
continued from page 565

be displayed on a color monitor can be replicated on the DataShow.

And Software Too!

Included with the DataShow is Sayett's ShowMaker software. The software consists of 3 stand-alone modules—a screen capture utility, a "presentation editor," and a "player" for the screen sequences. With the screen capture program loaded into memory, you can run your usual applications (from word processors to graphics) and, by pressing the "CTRL-ALT-MINUS" keys, you can have the current screen snatched and then saved out as a graphics file. Then, you run the editor and sequence your screens (up to 100 per show) in the order you want them presented. You can also add some interesting effects (reverse video or blinking) as well as time them or have them change with a keystroke or by the remote controller. When you have put together your presentation, you run the player module which reads your series and places them on the DataShow screen. While the ShowMaker software does what you want is advertised, it does not include any way to modify or enhance your captured screens. You cannot add titles and, compared to other presentation software, its wipes and special effects are limited.

Unique to the DataShow is the infrared remote control (Figure 2). When you connect the serial cable from the DataShow to your computer, you open the door to the wireless remote. With it comes some amazing tricks. The 15-button keypad has 4 arrow keys, a menu and select button, the numbers 0-9 and an asterisk and "N" (presumably for "normalize") key. You load the driver software and control your presentation from across the room. For example, the "*1" combination produces

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Figure 3. The perfect slide system—Kodak DataShow teamed with a Toshiba T1000 laptop.

EISA May Make
continued from page 564

be available in February for first sampling, will fit well on this bus. The Intel processor is expected to execute a register move instruction (the measure of speed in a RISC device) in about 1.8 clock cycles. In contrast an 80386 at 20MHz executes the same instruction in about 7 clock cycles.

The implications are clear, at least for Nubus. The economies of scale exist, there are no restrictions, it's here and it can support new processors efficiently. It is widely supported and Texas Instruments is offering integration silicon.

Similarly, MCA is here. It works and the bugs are worked out. It can support a wide range of processors, and integration silicon is in existence from multiple sources including; Bull Micral, Chips & Technologies, and Intel.

In contrast EISA isn't here. It appears to be a functional specification rather than a working one. It will be at least a year before integration silicon exists and it appears, at least for now that it will be single sourced. Moreover, the EISA is top-ended and can't extend beyond 40MHz and most likely will have a lifetime of 24 months, 12 of which will be spent in development.

The Upshot

The microcomputer industry operates by jumping on bandwagons. Everyone is always looking for the front runner. In this case EISA is a marketing strategy. I believe one that is aimed at forcing IBM into granting more favorable MCA license conditions.

Industry analysts are claiming huge sales of microcomputers, and expansion of the industry. It doesn't appear to be so. One claim is that DRAMs are forcing a slow-down. That may be part of the answer, yet there is glut of parts but are being held off the market to keep prices high.

The real reason is that sales of systems are down and will continue to be down at least until June of 1989. Possibly, manufacturers are feeling this pinch and are looking for new ways to spur excitement. The announcement of EISA was for something that doesn't exist and won't for a year. But of course, that has never happened before in the microcomputer industry. ●

Flu Shot+ Disk#1119

Many computers users are now worried about how they can protect themselves from the viruses and Trojan horses that are out there—just waiting to attack an unsuspecting system.

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A second program, HDSentry, sets itself up in memory and monitors all commands sent to the hard drive of your system. If the command is potentially harmful in any way, such as if it tries to write to the drive or erase a file, HDSentry intercepts the command and prompts you for continuation.

As a good protection of your investment, this disk is a must.

System Requirements: IBM-PC or compatible with a hard drive.

The shareware version is available from PC-SIG for $6 plus $4 shipping and handling.

For additional information contact PC-SIG at 408-730-9291 or write PC-SIG 1030D East Duane Avenue, Sunnyvale, CA 94086. ●

The Big Match
continued from page 566

a reverse video of the current image. "*0" blanks the screen and "N" returns it. You can focus (to eliminate flickering of the pixels) with "*4." The arrow keys can be used to move forward and backward through a presentation. You can even have the ShowMaker software generate an electronic pointer on your screen by pressing "*6" and then move it around the screen with the 4 arrow keys. Further, the remote can be programmed to simulate virtually any keystroke(s) you care to use. In point of fact, you can actually control Lotus 1-2-3 or other software by programming the appropriate keystrokes and assigning them to the 1-9 keys.

Limitations

Of course, there are some problems. First, the display is not in color and, in reality, is not even in black and white. It is dark blue on light blue. It is clear and well-defined, but then you might be expecting more than you get. A major problem exists with the way the DataShow represents colors. The colors green, cyan, brown, and white will be shown on the DataShow as white (well, actually, light blue). Black, blue, red, and magenta will be projected as dark blue. If the software you want to use is locked into, for example, a white on green screen display, you are out of luck. The DataShow will show both as light blue and you will not get any contrast at all. The problem will seldom be insurmountable as most packages you will be teaching can have their screen colors adjusted, but it could be infuriating if they cannot. Heat is a problem for LCD devices used on overhead projectors. The overheads generate a lot of heat, particularly the older models, and as the temperature rises, resolution on the LCD pad drops off. While several such screens have built-in fans to cool the units, the Kodak DataShow comes with an external unit that fits between the unit and the projector. It is not the optimum approach to have to cart around a second piece of rather bulky hardware, but it does work. I had no problem using the DataShow on an old 3M overhead for well over an hour (Figure 3 on page 566). As mentioned, the Sayett software is functional and "free" (at least, bundled with the unit), but it needs some serious advancement to be useful beyond capturing screens. Kodak appears to realize

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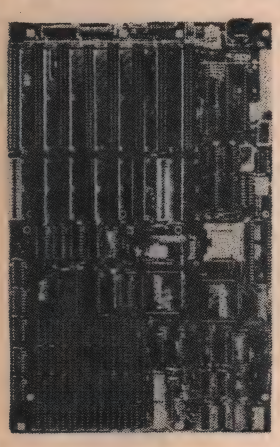

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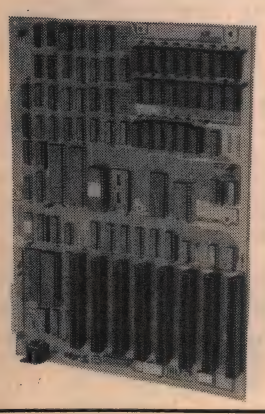

4.77/10 MHz TURBO BOARD

The UnSpreadsheet
continued from page 328

UnSpreadsheet, being sold for a Show Special price of only $10! Naturally, I bought it—and I'm very pleased with the new features.

What Is It?

The UnSpreadsheet is a unique calculating tool that combines the power of a spreadsheet with the simplicity of a calculator. Using a 3-column 20-line screen that combines formulas, variables, results and text, The UnSpreadsheet processes calculations quickly and efficiently. It uses a natural language interface that allows you to type calculations and formulas the way you think, using words, numbers and a multitude of built-in functions. Reference or report text can be entered at the same time as the calculation. There are no confusing column/row "cell" references, since only simple sequential line numbers are used.

Figure 1 show a typical UnSpreadsheet screen, this one for calculating a monthly mortgage payment, including taxes and insurance. This is a slight modification of one of the 100 templates provided with The UnSpreadsheet.

Notice that the left side of the screen shows the line numbers, variable names (up to 22 characters each), and formulas. The formula on line 7 is not completely shown, since it is longer than the 24 spaces allowed. Formulas can be up to three screen lines long! However, a View function within the program allows formulas to be shown in their entirety.

To use The UnSpreadsheet with an existing template, you enter the values of the variables, such as PURCHASE = 129500. You do this for each of the variables, and the calculations ripple down the screen immediately. You can change any value to see the "what-if?" effect. You can enter several variable values on one line with a colon between them, such as:

PURCHASE=129500:DOWN=79500:TERM=358:
RATE=9.75%

Similarly, you can change variables, formulas or text, and insert, delete or move lines. It's all very easy, using the Enter line near the bottom of the screen. You just type what you want. Simple editing functions are provided. When you hit the ENTER key, the effect is immediately shown on the screen. The flexibility is really amazing. Error-trapping is extensive, so the program is very bullet-proof, if not bomb-proof! I have not been able to crash it.

New Features

When I first used It Figures, back in 1986, I was very pleased with the program, but found a few things about it that I felt could be improved. Not only have these improvements been made, but a bunch of new features I didn't even think about have been added. Comparing the new Version 3.0 with Version 1.2, I found the following new features:

(1) The UnSpreadsheet screen can now be saved not only as a working file or template, but the title, text and results can also be saved in ASCII format. This allows importing this report into most other popular software programs, including word processors! This is a major new advantage.

(2) Text, on the right side of the screen in former versions, can now be placed on the left side of the screen. This makes sense in some presentations and provides a more report-like appearance for hard copy print outs or exporting to other programs.

(3) More printer functions have been added, including Select Printer and Printer Setup, for customizing the output. A plain-vanilla printer can still be used. Title, text and results can be previewed on the screen before printout.

(4) Over 50 new templates have been added. This is by no means the limit to the use of the program, since you can easily modify any existing template or create new ones.

(5) The new typeset 92-page manual is easier to read and easier to understand. A tutorial approach is used throughout, with both an excellent Table of Contents and Index. Twenty-two illustrations (mostly actual screen dumps) help you quickly get up to speed.

(6) Five sub-directories (Business, Finance, Personal, Real Estate and Math) are now used to separate the 100 included templates. You can also add your own sub-directory category. A hard disk is not needed since all program files and templates can fit on a single 360K floppy disk with most DOSs.

(7) A DOS shell is included, allowing you to perform typical DOS functions (DIR, COPY, FORMAT, etc.) without actually leaving the program. When your DOS function is completed, you are returned to The UnSpreadsheet screen.

(8) Conditional statements (IF/THEN/GOTO/WAIT) have been added, making it easier to program your applications.

Using The UnSpreadsheet

I like simplicity, which seems to be rapidly disappearing from the microcomputer world. For example, to avoid the confusion of sub-directories and path commands, and the need for strong backup discipline in anticipation of the eventual hard disk crash, I have steadfastly refused to get a hard disk drive for ANY of my nine micros!

Aside from my business and writing magazine articles, I have very little use for a computer. I'm distressed at how even the simplest tasks have now evolved into complex programs that take many hours to learn to use.

The UnSpreadsheet is a welcome relief in its straightforward relative simplicity. I used it with both my IBM

continued on page 569

MORTGAGE — MONTHLY MORTGAGE PAYMENT — METRIC

1	+PURCHASE	129,500.0000	Original Purchase Price
2	+DOWN	79,500.0000	Down Payment
3	+TERM	358.0000	Length of Loan in Months
4	+RATE	.0975	Interest Rate Charged
5	+PURCHASE-DOWN	50,000.0000	Mortgage Amount Financed
6	+L4/12	.0081	Periodic rate
7	+L5*(L6/(1-((1+L6)^(-TER"	429.9800	MONTHLY PAYMENT
8	=		
9	+ACCINSURE	88.9200	Accident/Health Insurance
10	+TAXES	1,537.9800	Annual Real Estate Taxes
11	+INSURE	571.0800	Annual Insurance Premium
12	+L9+L10+L11/12+L7	613.1450	TOTAL MONTHLY COST
13	=		
14	=		
15	+L7*L3	153,932.8562	Total Months Loan Payments
16	=		
17	=		
18	=		
19	=		
20	=		

Enter:
F1 List F3 Load F4 Save F5 Dec F6 Prnt F7 Help F8 Varabl F9 Key F10 Calc

Figure 1—Monthly mortgage payment template, modified.

The Big Match
continued from page 567

this and sells a much more advanced presentation package, the Show Partner from Brightbill-Roberts (120 E. Washington St., Syracuse, NY; 315-474-3400) in a version modified specifically for the DataShow and its remote controller software. I wish they would drop the Sayett package and just bundle the Show Partner to start with.

Conclusions

The Kodak DataShow is an excellent hardware addition to anyone who is called upon to consult or teach computers. It enables you to optimally show a computer-user interaction for any software. Further, with the addition of presentation software, you can generate superb graphics that will rival traditional 35mm slide shows and, certainly, surpass traditional clear transparencies.

Summary: The Kodak DataShow (Eastman Kodak, Audiovisual Products Division, 343 State St., Rochester, NY 14650; 800-445-6325) is an excellent hardware/software package for anyone who must teach others to use computers. It allows for instructing large groups using real-time displays with a minimum of eyestrain. With presentation software, you can also produce exciting slide shows.

Specifics: Retail price: $1270.00 including Sayett ShowMaker software, infrared remote controller and software drivers, and external fan. System requires IBM or compatible, 256K, at least 1 disk drive, RS232 port (for remote control options), and CGA graphics adapter. ●

The UnSpreadsheet
continued from page 568

PC/XT (640K RAM, two 360K 5¼" floppy drives), and my Sanyo MBC 555-2 (256K RAM, two 360K 5¼" floppy drives) with no problems. You'll need at least one 360K floppy drive and 192K RAM, with any monitor or printer. The distribution disk is not copy-protected.

You can be up and running in an hour or two with the existing templates. It takes about an hour to read through the manual, and about 16 minutes on a two-floppy system (less on a turbo or AT machine) to go through the simple installation procedure. If you want to create your own applications, figure on another hour or two.

An INSTALL program on the distribution disk allows for transferring program files to a system floppy diskette, or onto a hard disk. All the necessary sub-directories are created, then program files and templates are copied. You only have to answer a few simple questions, like whether you have a floppy or hard disk system, and whether you have a monochrome or color monitor.

The INSTALL program determines if your display uses standard screen addressing (PC/XT/AT/jr) or nonstandard screen addressing (Sanyo MBC 55X, Tandy 2000, others), allowing this program to be used with most IBM PC workalikes. Furthermore, the ALT key (omitted from some keyboards, such as the Sanyo) is not used for any functions or commands, contributing to the compatibility of The UnSpreadsheet with most MSDOS machines.

When the worksheet comes up on the screen it is shown with conventional light characters on a black background, and asks for a Title. Hit ENTER and the F2 key and you're presented with a color selection chart that shows code numbers from 0 to 127. Each code shows actual text and background colors. If you're using a monochrome monitor, you'll see two brightness levels and black, including reverse video, as your choices. If you're using a color monitor, you'll see the actual color combinations.

You then choose the Main Color Number (for the text and background of the body of the worksheet) and the Key Color Number (for the title, line numbers, borders, and key legends). The default code numbers are 15 (MAIN) and 7 (KEY), which provide characters with two levels of brightness on a black background. Readable enough, but not very exciting. I changed these codes to 120 and 30 respectively. On an IBM PC/XT with CGA, this shows black characters on a gray background for the main screen, and yellow characters on dark blue for the key colors. On a Sanyo, the gray is white.

Incidentally, my PC/XT has both monochrome and CGA boards, with monochrome the default and CGA invoked with the MODE CO80 command when in DOS. Although I specified monochrome during the INSTALL process for The UnSpreadsheet, it ran in beautiful color without rerunning INSTALL when I used CGA. On the Sanyo, both the color and monochrome monitors display at the same time, with no special preparation or commands. (Another reason the Sanyo 55X is the best micro I've ever owned!)

I was very pleasantly surprised to find that MSDOS 2.11 left plenty of room on a single 360K disk for many files in addition to The Unspreadsheet program files and templates. If you use a 360K disk with MSDOS 3.2 you'll have room for very few additional files, and with MSDOS 3.3 you'll need to remove the INSTALL program from the working disk to even have room for all the templates! However, if you use a 720K disk (either an AT, or 3.5" microdiskette), you'll have lots of space for more files.

After getting familiar with the program and gaining some confidence that you won't destroy your worksheet with a command error, you'll probably begin to really respect the power at your fingertips. I'd suggest going back through the manual and you'll find all kinds of features you overlooked that are sitting there waiting to be used.

One example of the versatility of The UnSpreadsheet is the use of local and global variables. Variables, which generally appear as a word or string of characters in a worksheet, represent formulas or numbers which can be used throughout a worksheet. Local variables are specific to a single worksheet. Global variables can be used throughout any worksheet, and are loaded from files of global variables that can each contain as many as 100 global variable definitions.

continued on page 572

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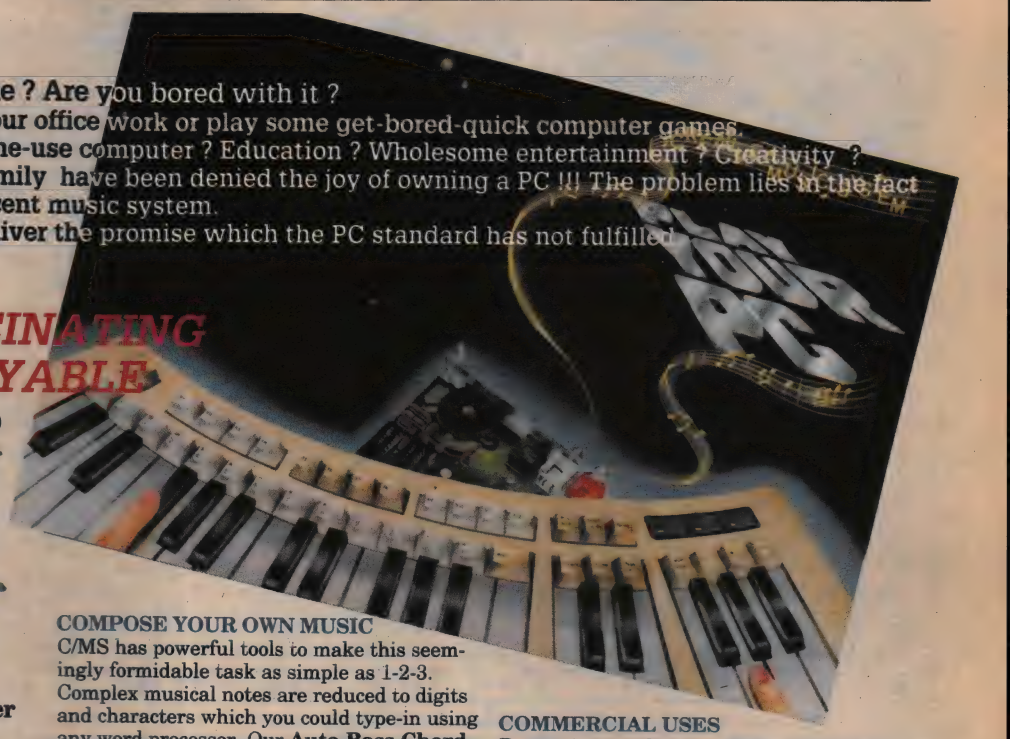

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Grayscaler II Replaces IBM RGB Monitor

Figure 1—Grayscaler II is small, but powerful.

by Fred Blechman

Wow! For only $39.95, you can run all the MSDOS and graphics programs that normally require an expensive RGB color monitor. A small hardware device called the Grayscaler II does this by simply plugging it into your CGA card 9-pin display socket. You use an inexpensive composite monochrome monitor instead of the about-$300 RGB monitor. Each of the possible 16 colors available from a CGA card appears as a different level of brightness on the monochrome screen. This can save you a couple of hundred bucks and allow you to run programs that you could not run before—with absolutely no special software or procedures!

Huh? What?

Having said that, many readers will not have any idea what I'm raving about, so it is necessary to give some background and technical details—although using the Grayscaler II device could not be simpler. I'll try to avoid getting overly technical in explaining the genesis of the problem, and why the Grayscaler II is such a neat device.

CGA Board Outputs

There are two output jacks on the rear of a standard CGA (Color Graphics Adapter) card: an RCA phono jack, and a 9-pin DB-9 jack. The 9-pin jack is where you plug in a TTL (5-volt signal level) RGB (Red-Green-Blue) monitor. Individual pins are used to separately carry red, blue, green, intensity, horizontal sync and vertical sync signals. This complexity is expensive, but allows excellent color monitor clarity.

The phono jack is much simpler, consisting of only two connections. The central one carries the actual signal while the outer one serves as a return path and shield against noise pickup.

continued on page 571

```
10 REM * COLORGRA.BAS *
20 CLS
30 FOR C=0 TO 15
35 READ C
40 COLOR C
50 PRINT "This is color ";C;
60 PRINT TAB(19)STRING$(20,219)
70 NEXT
100 DATA 0,1,2,3,8,9,10,11,4,5,6,7,12,13,14,15
```

Listing 2—Grayscale sequence

```
10 REM * COLORIBM.BAS *
20 CLS
30 FOR C=0 TO 15
40 COLOR C
50 PRINT "This is color ";C;
60 PRINT TAB(19)STRING$(20,219)
70 NEXT
```

Listing 1—IBM color sequence

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Grayscaler II
continued from page 570

The signal is a blend of all six signals present at the 9-pin jack. Because it is a mixture, it is known as composite video (also known as NTSC video, a U.S. standard established by the National Television Systems Committee.) This jack is intended for use with a composite monochrome (single color—green or amber being the most common) monitor.

Another output, on the board itself, is a 4-pin strip that provides + 12 volts, composite video and a ground connection. It is intended for use with an RF (Radio-Frequency) modulator for display on a color TV set. This output is essentially limited to 40 characters on a line, and full of RF interference. Hardly anyone ever uses this output.

Choosing A Monitor

The two CGA jacks allow the user to choose between three different types of monitors: composite color, composite monochrome, and TTL-RGB color. These monitors differ considerably in price and capability.

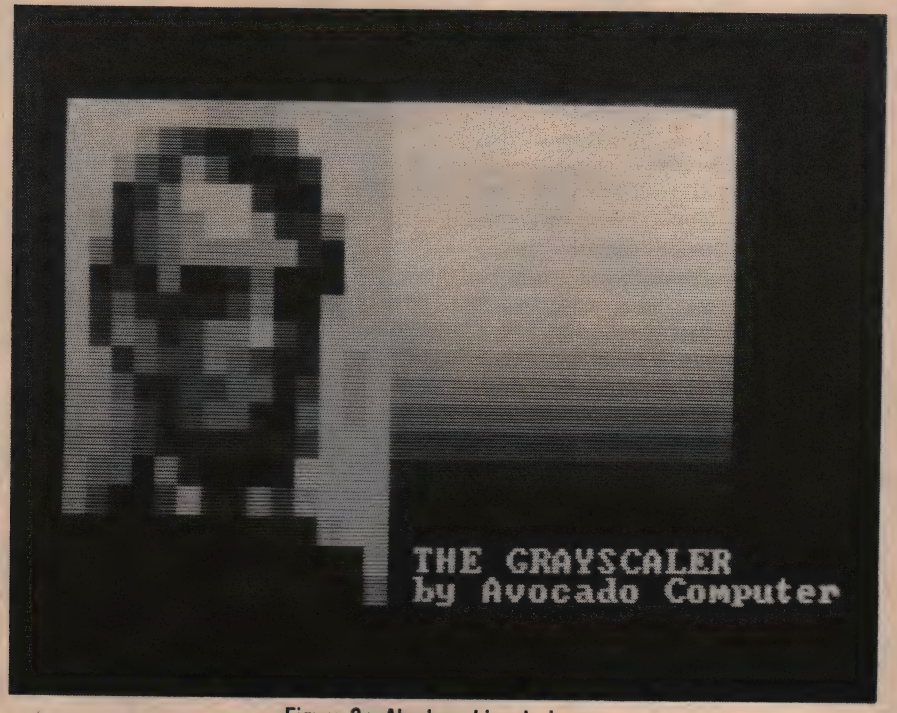

Figure 2—Abraham Lincoln in gray.

Composite color is the least satisfactory. These monitors are designed for broadcast video use as TV and VCR monitors, so their resolution is essentially limited to 40-column text operation by the NTSC color encoding. They are also moderately expensive. You can expect to pay $150-$250 for a composite color monitor.

Composite monochrome monitors are getting harder to find since IBM started using TTL monochrome monitors. However, because they were commonly used with most earlier microcomputers, they evolved into high-resolution displays for well under $100. If you've had a microcomputer before, you probably have a composite monochrome monitor hanging around not even being used. If it has an RCA jack as an input, it's a composite monitor. With the Grayscaler II composite monochrome monitors can produce excellent displays with a different brightness level for each of the 16 available CGA colors.

A TTL-RGB color monitor, used with CGA, handles 80-column text and is best for applications that demand crisp, high-resolution color. It is also the most expensive of these three types of monitors, usually running $300 or more.

Beyond that, a whole new class of expensive ($500 and up) high-resolution, multi-sync, analog-RGB and TTL-RGB

continued on page 572

TABLE 1

Grayscaler Level		IBM Color Number
Level	0 (black)	0 black
"	1	1 blue
"	2	2 green
"	3	3 cyan
"	4	8 dark gray
"	5	9 light blue
"	6	10 light green
"	7	11 light cyan
"	8	4 red
"	9	5 magenta
"	10	6 brown
"	11	7 light gray
"	12	12 light red
"	13	13 light magenta
"	14	14 yellow
"	15 (white)	15 white

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Grayscaler II
continued from page 571

color monitors are used with the newer EGA (Enhanced Graphic Adapter) and VGA (Video Graphic Array) modes available for IBM machines. Some of these will not work with a CGA board.

Do You Need Color?

Color is nice if you have an application that needs color, but this is comparatively rare. More often a common green or amber screen is perfectly satisfactory, since composite monochrome is the lowest cost monitor option, has excellent resolution, handles 80-column text, and is standard in the computer industry.

However, since the CGA composite output jack carries a color signal, this creates its own problems. Not being a color monitor, a monochrome monitor has no idea what to do with color information. The superfluous color information appears as garbage on the screen.

The color information is piggybacked on the video signal as a 3.58 megahertz subcarrier which creates a windowscreen of fine vertical stripes. These show up wherever color is present in the picture. Of the 16 possible colors, 12 create garbage and only 4 do not—black, white, dark gray, and light gray. The other 12 make hash of text, graphics, and even blank screens. This can make life miserable with software packages that feature colored text, graphics, or backgrounds.

The IBM color graphics card has a "black and white only" mode which simply throws away all color information, leaving just the four neutral colors presented in monochrome brightness levels. The resulting appearance is washed out and anemic. Since these four "colors" have to represent the whole set of sixteen, frequently you can't tell intended colors from each other. The common result is that text and objects can seem to disappear. Even when this 4-color mode is engaged, it is frequently overridden by graphics routines in the program you're using, and some colors disappear!

The Grayscaler II

The Grayscaler II is an inexpensive ($39.95), small (approximately 2"x1"x1") adapter that provides a trouble-free connection of composite monochrome monitors to a CGA card (or EGA card running in the CGA mode.) One end of the Grayscaler II has a DB-9 male plug and the other end an RCA jack, as shown in Figure 1 on page 570.

The Grayscaler II plugs into the RGB jack of any CGA card. Next, simply plug the RCA plug from a composite monitor cable to the Grayscaler II RCA jack instead of directly to the CGA card. With the Grayscaler II installed, there is no difference between your composite video monitor and an RGB monitor, other than the substitution of brightness levels for colors—and the price saving. Since the Grayscaler II is outside the computer it uses no slot. It is also transparent to software.

The Grayscaler II generates sixteen brightness levels in place of color. Since the output has a one-to-one substitution of brightness for color, all colors are distinguishable from each other, and crisp gray areas replace the windowscreen effect. The result is equivalent to an RGB monitor, and generates legible displays regardless of character color.

The improvement over connection to the color card composite output can be striking, even for simple demos such as the IBM ball program. The 16-level gray scale also has other uses. Sample BASICA/GWBASIC program listings (included in the excellent 13-page User Manual, which is primarily of interest to programmers) give examples of math plotting in three dimensions, using brightness to give an illusion of depth. Another program illustrates a gray scale image. There are also programming tricks for 160 by 100 resolution and 61-level gray scale interpolation. However, if you are a plain-vanilla user, don't worry about any of these things. Just plug in the Grayscaler II and it works.

Word Processing Versus Imaging

The four neutral shades (black, white, dark gray and light gray) of the 16-color CGA palette are not assigned number codes in the sequence you would expect. Logically enough, black and white are at opposite ends—0 and 15, respectively. However, a quirk in the IBM assignment table assigns light gray to code 7 and dark gray to code 8. Furthermore, the brightness of dark and light gray are much more than one step apart. Programs written for CGA depend upon this code assignment to properly perform such word processing functions as highlighting and translating screen displays for printer dumps. See Table 1 on page 571 for standard Grayscaler levels and IBM color numbers.

On the other hand, gray scale imaging, function plotting, and other applications benefit from a simple linear assignment of 0 = black to 15 = white. This way the codes which differ by 1 also differ in brightness by 1 step, with the higher number the brighter.

This difference in color code inter-

continued on page 581

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The UnSpreadsheet
continued from page 569

Included with The UnSpreadsheet is a default global file called METRIC.VAR. It contains twelve metric conversion formulas, two financial formulas and twelve month conversions to days (although the latter are not shown in the manual.) This file is loaded automatically when you enter the worksheet. You can define, list, change or delete global variables in this file, as well as create, list, change and delete your own custom global variable files.

I use The UnSpreadsheet to keep track of my various liquid assets: savings accounts, checking accounts, mutual funds, money market funds, IRA accounts, single-pay-premium insurance and so forth. This takes three worksheets (I call them INVEST1, INVEST2 and INVEST3) which are chained together to carry the results from one to another. It's very easy to change figures periodically as values in the various accounts change, or as I add or delete accounts. I can print these out for a permanent record to see periodic changes and growth.

Using my favorite IBM PC word processor (The BetterWorking Word processor, which I rave-reviewed in March 1988 *Computer Shopper*, starting on Page 250) I was easily able to import any UnSpreadsheet screen (saved in Export mode) for any additional editing.

This program is worth the suggested retail price of $49.95, but I was troubled that it was being sold so freely at computer shows for only $10. It seemed unfair to those who didn't happen to run across The UnSpreadsheet at a computer show.

I asked Lester Karplus, president of SimplSoft Products, the producers of The UnSpreadsheet (and some other programs I don't have) about this. He explained that the cost of invoicing, shipping, handling, phones, personnel and so forth were being supported by the regular retail sales, but that the special offer at computer shows allowed SimplSoft to move lots of products quickly and simply to establish a large user base.

I asked if he could make readers of *Computer Shopper* a special offer. He agreed to offer a 1-template version of the UnSpreadsheet—if you mention this article when you order—for $10 plus $2 for postage and handling (USA only!). If you want The UnSpreadsheet on a 720K 3.5" microdiskette, add another $2, for a total of $14.

If you want the program with all 100 templates on a 5¼" disk (normally sold for $49.95 plus $2 shipping and handling), mention *Computer Shopper* and send $24.95 plus $2 for shipping and handling ($2 additional for 3.5" microdiskette).

The UnSpreadsheet
SimplSoft Products, Inc.
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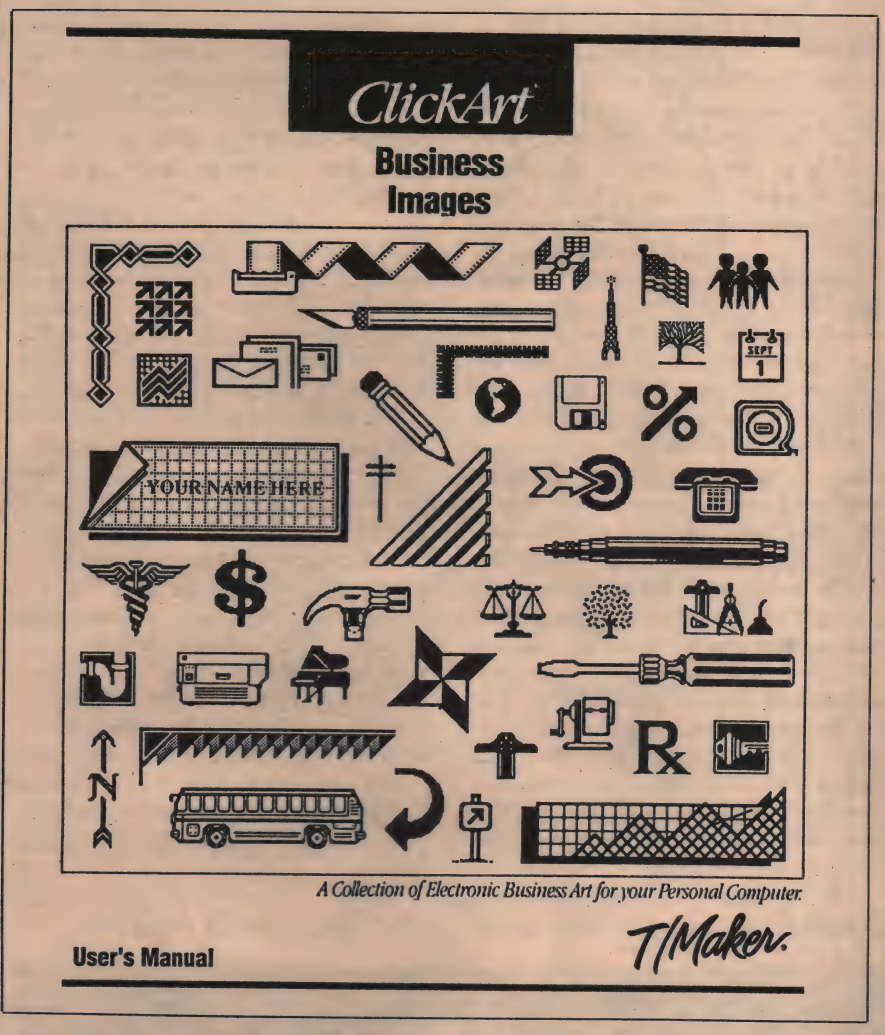
See previous prices ●

T/Maker's ClickArt Library (For Windows, GEM & Macintosh)



by Peter Ruber

The folks who brought you T/Maker (an integrated software package for IBM-PC, generic MSDOS, and CP/M computers), WriteNow for the Macintosh, and other programs, are now turning their talents to graphics for the burgeoning desktop publishing market.

T/Maker Company currently has six ClickArt Image Portfolios available, which are grouped as Personal Graphics, Business Images, Christian Images, Publications, Holidays, and EPS Illustrations. Together they contain more than 2500 illustrations and designs that are suitable for business brochures, club newsletters, advertising, letterheads, menus, invitations, presentation slides, and whatever else you fancy.

Each ClickArt Image Portfolio is published in three separate formats: a Macintosh version supporting both MacPaint and HyperCard Stackware, and two IBM-PC versions. One of these is for Windows, PC Page-Maker, PC Paintbrush and ByLine; the other for GEM, Ventura Publisher, and PCX file formats. With the exception of the EPS Illustrations package (which contains Encapsulated PostScript files and costs $129), the Mac packages list at $49.95, and the two PC versions are $69.95 each. The PC ClickArt Image Portfolios are distributed on 5¼" 360K media. If your computer only has 3½" disks, T/Maker will exchange the media at no extra cost.

The documentation for each ClickArt graphics package is essentially the same. The installation and "how-to" sections cover the Macintosh, Windows and GEM versions. Sifting through the instructions for three separate versions may seem a bit confusing at first, but there are many similarities between these graphics environments. However, when a specific operation differs for any platform, they are highlighted in the left-hand column of the page. Using this approach cuts down on production expenses and helps to keep the software priced reasonably.

Each ClickArt manual contains a complete index, of and reproductions of, all illustrations. Step-by-step instructions are provided for "lassoing" individual graphics from a page, and how to crop and edit them through the "zoom" or "fat-bits" modes available with most paint packages. T/Maker has also included examples of how ClickArt can be cut, pasted, merged, cropped, and duplicated to enhance your layout.

Due to the abundant use of 200-line CGA monitors in the GEM and PCX environments, some images have been shortened to ensure compatibility across all GEM and PCX applications and

continued on page 574

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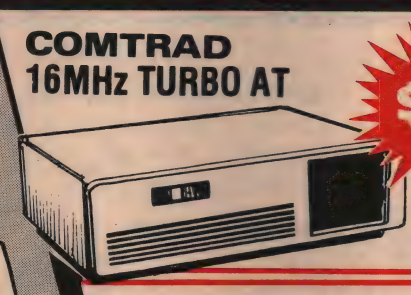

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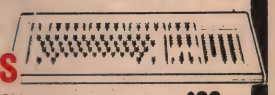

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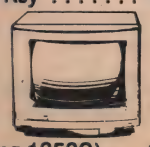

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T/Maker's ClickArt
continued from page 573

hardware options. However, if you're using GEM with EGA or VGA drivers, you should be able to work with most of the illustrations in their entirety.

What impressed me about this series of computer graphics art is the overall quality of the designs. Each subject category isn't limited to illustrations representing the theme of the package, but includes ornamental designs, borders and frames that can be combined in an endless variety of layouts.

Print output has been optimized for dot matrix printers at 72dpi and for laser printers at 300dpi. While low resolution pixel graphics printing has a tendency to translate curved areas or diagonal lines as ragged steps, T/Maker has managed to create a high degree of smoothness. If your Windows or GEM application has a 24-pin dot matrix driver, you'll achieve even better results. However, if your finished product requires a professional appearance that rivals hand-drawn art, you would be advised to use a laser printer. For the highest quality printed image, Apple LaserWriter or LaserWriter Plus users can use the "Smoothing" option located in either the Page Setup Box or Print Box of your page-layout or paint application.

ClickArt disks aren't copy protected and should be archived before you use them. You'll need anywhere from two to eight blank, formatted disks depending on the package. The Macintosh image files are shipped in the MacPaint format and can be immediately accessed by MacPaint or a MacPaint-compatible program like HyperCard or SuperPaint. They can also be accessed by desk accessories like ArtGrabber+.

ClickArt images for the PC versions are shipped in a compacted format and are converted to the proper file format for your graphics environment during the installation process. Although you can install ClickArt images on floppy disks, you're better off using hard disk drive storage for the speed advantage in storing and retrieving a graphics file.

The disks have a series of batch files that prompt you through the installation process, and automatically convert the files into a usable format for your graphics environment. During installation, ClickArt creates a separate DOS sub-directory on your hard disk for each Image Portfolio, which will consume anywhere from 1.2MB to 3MB of space. You can, however, elect to install only select groups of images by copying one or more filenames to a sub-directory on your hard disk. For this procedure you must also copy the Art-Exchange Utility to the sub-directory so that you can rename the image file to the proper format.

continued on page 575

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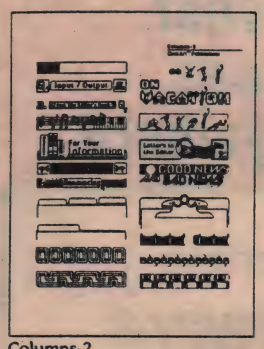
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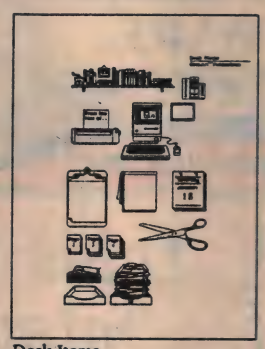
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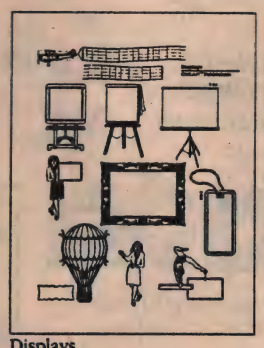
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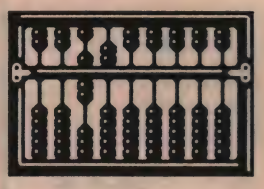

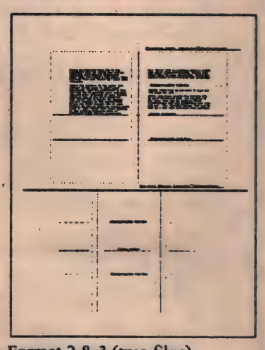
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T/Maker's ClickArt
continued from page 574

The most elegant graphics can be found in the EPS Illustrations package, which offers 175 images on 8 disks. As mentioned earlier, these are Encapsulated PostScript files. PostScript is a powerful page-description language which allows you to create detailed, sharp images which never lose their high quality resolution, regardless of orientation or dimension. An EPS image will look as sharp at an enlarged or reduced size as it does at its original size.

PostScript provides any PostScript-compatible printer, such as the IBM Personal Pageprinter, the Apple LaserWriter, or the Linotronic 100, with the information needed to print an image. However, by itself, PostScript does not give your computer the information necessary to create an image on its screen. This is why Encapsulated PostScript is important.

In addition to containing the information needed for a printer to output a PostScript image, Encapsulated PostScript contains a screen version of an image. This enables you to see an accurate screen representation of what a printer will output. Even though you may not have a monitor that can display PostScript images directly, you are able to preview a representation of your PostScript image for placement and sizing on screen prior to printing.

Although the PostScript page-description language is becoming universal in its popularity and use, the printing tolerances and mechanisms of PostScript-compatible printers are often different. Therefore, depending on the PostScript-compatible printer you use, variations in tone and line width of EPS images can be expected.

The following is a partial list of IBM PC applications that can import EPS images: PC PageMaker 1.0, Ventura Publisher 1.1 (print only) and ClickArt Scrapbook + (view and store only). And these Macintosh applications: PageMaker 2.0, Ready,Set,Go! 4.0, XPress 1.04, CricketDraw 1.1 and Adobe Illustrator.

The EPS Illustrations consume a lot of disk space. It is advisable to import only those illustrations which you may need for your application. Most of these are stored under their own filenames instead of being grouped together as they are in the other Macintosh, Windows, and GEM packages.

Other T/Maker Graphics Software

If you feel comfortable working with your paint and desktop publishing program, you'll easily master T/Maker's ClickArt graphics. Rather than waste a lot of copy trying to explain the scope and variety of the ClickArt graphics, let me encourage you to write to T/Maker for an interesting 48-page catalog that showcases this software.

It will also introduce you to additional software packages that you may find useful in desktop publishing applications. These include ClickArt Scrapbook + for Windows ($129.95).

continued on page 581

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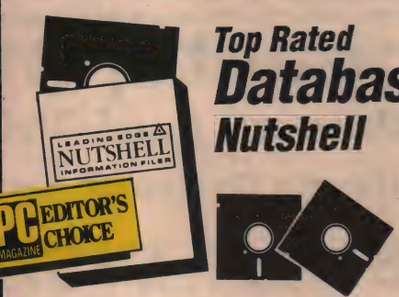

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- Splits screen for access to 2 documents at once
- Tabs, centering, margin reset
- Cut and paste features
- Time and date commands
- Text and keystroke macros
- Automatically backs up files
- Version 1.3

PC MAGAZINE: *"This program is a gem, and at $250, its a gem of a bargain."*

Software Digest: *"Offers the best balance of user friendliness, performance and features."*

Product #	Item	Price	Shipping& Handling
LE999-CS11	Leading Edge Word Processor	$19.95	$7.00
LE888-CS11	Word Processor w/ Spell & Merge Options	$39.95	$7.00

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Quick Shipping:
All in-stock software will be on its way to you within 48 hours.

Orders Only Call:

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Product Information & Customer Service
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Grand Rapids, MI 49508

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Laptop Sale

SHARP Laptops -SPECIAL- $699

- 640K RAM
- Dual 3.5" Drives
- High speed processor (7.16 MHz)
- Battery & AC Operation
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~~Manufacturer's Retail $1375~~

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PC - 4501-3
Sharp's Top-of -the-Line Supertwist Laptop

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Powerful: 640K RAM (expandable to 1.6meg) • 2 built-in disk drives • High speed processor (7.16 MHz) 42% faster than IBM

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Convenient: Compact Single Unit Design, 12" x 13-1/2" x 3" • Weighs only 10 lbs • Battery or AC Operation Lets you use the computer anywhere: At home, At school, in the office, at a client's, in a library, in a plane or train, your backyard patio or even in the woods. Lead Acid Battery provides 7 hours continuous use without recharging. • Easy to use; can be recharged anytime (unlike NiCad batteries used in many laptops - which must be fully discharged before being recharged). • Hinge of screen can be flipped 180°. • Alarms indicate low battery or if you close the cover while unit is still powered on to prevent you from accidently running down the battery. • Keyboard controls let you set the clock calandar settings, switch between graphics and text modes, customize type of cursor, set unit to power on at designated time (for example to automatically make overnight data transfers). • Toll free customer support line.

Affordable: This is the lowest priced laptop available anywhere...compare its features and price with any laptop anywhere. Info World called this laptop a "satisfactory value" at $1375. They are obviously a super value at our price which is half that price! **At $699 these laptops won't last long... Order Now!**

Specifications

CPU: .80188 Compatible (7.16MHz)

Memory: RAM 640K

Floppy Disk Drives: 2 Built in 3.5" 720K Floppy Drives

Display: high contrast supertwist crystal display • capacity: 80 characters x 25 lines (640 x 200 pixels) • 0° - 180° tilt angle adjustment

Keyboard: 78-key step-sculptured keyboard with integrated numeric keypad

I/O Ports: Parallel (Clentronics) port. External port for optional external 5 1/4" Floppy Disk Drive

I/O Slots: Slot 1 For optional CRT adaptor of EMS card; Slot 2 for optional modem or Serial Card

Dimensions: 12-1/8" (w) x 3" (h) x 13-3/4" (d)

Weight: approx. 10lbs.

Power supply: lead battery (7 hours operation) • AC adaptor

Operating system: MS DOS 2.11 included (works with DOS 3.2 etc)

Options: Internal Modem Card plus Serial Port • Serial Card • EMS Card (IMB) • Color/monochrome CRT adaptor (CGA and MDA compatible • External 5-1/4" AC powered floppy disk drive unit • High quality, custom made carrying case...fully padded with shoulder strap and pocket.

1 Year Warranty: Covering both parts and labor.

What Reviewers Say

INFO WORLD -December 1987

"No compatibility problems...

Unit was sturdy...stood-up to rough treatment...

The supertwist LCD feature...keeps the screen readable -- even in less than perfect light conditions.

Toll free technical support line...helpful, knowledgable technical support department."

Product #	Item	Price	Shipping Handling
LAP53-CS11	Sharp 4501-3 laptop w/ 640K, 2-3.5" 720K drives & supertwist LCD display	$699	$39
CAS-CS11	Custom Carrying case for the Sharp 4501-3	CALL FOR PRICE	
DSK-CS11	3.5" Diskettes (DSDD)	CALL FOR PRICE	
LE3-CS11	Leading Edge Word Processor with Merge/Spell*	$49	$7
DIA3-CS11	Diamond Integrated Software (Lotus 2.0 comp.)*	$79	$7
NUT3-CS11	Nutshell Database Software*	$49	$7

*Software comes on 3.5" disks.

Other Options: Call for information about price and availability. Modem Card • Serial Card • EMS Card • Printer Cables • Monochrome CRT adaptor • External 5-1/4" 360K floppy drive.

Compare the Sharp 4501-3 from Tredex with any Laptop sold through Computer Shopper
(October 1988 issue)

Advertised model	RAM	Drives	Display	Price
Tredex Sharp 4501-3	**640K**	**2**	**supertwist**	**$699**
Toshiba	512K	1	supertwist	$749
Amstrad	640K	2	supertwist	$1149
Sharp 4501-1	256K	1	supertwist	$699

COMPARE!

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In California 213-277-1136

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50 MB Hard Drive With Controller $379

- Western Digital Controller
- 49.5 MB formatted capacity
- 85 ms • 1/2 height
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2400 Baud Modems Hayes Compatible $99

Lowest Price Anywhere!

For IBM XT, AT & Compatibles

- 2 year warranty
- BitCom Communications Software Included!
- Ready to hook up
- Super easy to use and install

Made by computer peripherals inc.

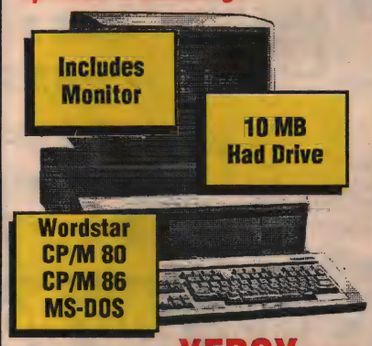
Shipping & Handling $11.00

10 MB Xerox Computer

Only $249

~~Original Mfr. Retail $4395.00~~

Complete System With Wordstar, Spellstar & Mailmerge



XEROX 16/8

CPU • Intel 8086 16-bit processor • Zilog Z80A 8-bit processor • 128K RAM (expandable to 256K) available for 16-bit operations, 64K RAM available for 8-bit operations • Internal 10 MB hard disk drive • Internal 5.25" DSDD 360K floppy drive • 1 serial communications port • optional parallel port
Monitor • 12" monochrome monitor • 80 column by 24 line display
Keyboard • 12 programmable function keys, 6 system function keys • Seperate numeric and cursor keypads
Software • CP/M 80 (for 8-bit CP/M processing) • CP/M 86 (for 16-bit CP/M processing) • MS-DOS (note: the Xerox 16/8 is not IBM PC compatible) • Utility software to convert data files from CP/M format to MS-DOS format and vice versa • Wordstar-The industry standard word processor • Spellstar-Checks spelling using 20,000 word dictionary • Mailmerge-Creates mailing lists, merges files • StarIndex-Indexes your documents and creates tables of contents
Warranty: 90 day Tredex warranty

Product #	Item	Price	Shipping& Handling
XU16S-CS11	Reconditioned Xerox 16/8 Computer System w/ Serial Printer Port	$249	$49.00
XU01P- CS11	Parallel Printer Port Kit for Xerox 16/8 Computer (available only with purchase of computer)	$29	FREE

50 MB Turbo XT System

Only $1099 CompleteSystem

Micro Five by SAMSUNG

- 50-MB Okidata RLL Hard disk (formats to 49.15 MB)
- 640K-RAM • One 360K floppy disk drive
- 8088 -2 processor • Hercules compatible mono-graphics on main board • Real-time clock calendar • AT-style keyboard w/LED
- Serial/Parallel ports • Compact space-saving case • MS-DOS 3.2/GW-Basic + Tech Reference manuals • Samsung 12" TTL amber tilt-swivel monitor • Entire system UL/FCC/CSA approved
- One year manufacturer warranty

Product #	Description	Price	Shipping & Handling
SPC50-CS11	Micro Five Turbo XT system, no monitor, no hard disk	$675	$49
SPC50TTL-CS11	Above system with Samsung 12" TTL high-resolution amber monitor, tilt-swivel	$1099	$49
SPC50RBG-CS11	Above system with Samsung 14" RGB color monitor, 640x200 resolution tilt-swivel	$1405	$49
SPC50EGA-CS11	Above system with Samsung 14" EGA color monitor, 640x350 resolution, tilt-swivel	$1620	$49

SYSTEM OPTIONS: Prices with purchase of Micro Five system only.
Please call to request price & availability. • 2400-baud internal Hayes compatible modem • 6-outlet 110v single-switch heavy duty surge protector
• Combination package: includes Leading Edge Word Processor & Spell Checker, and Leading Edge Nutshell Software

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Centronics Laser Printer

by GENICOM

- 512 K Ram (optional 1.5 Meg available)
- 8 pages per Minute
- Parallel Interface
- 300 DPI resolution

Mfr. List Price ~~$2495~~

$799

Compatible • Standard Epson FX-80 Emulation • Optional HP Laser Jet Plus Printer Emulation • Resident Font -Courier 10

Includes the following features: • 8/12" x 11 and 8 1/2 " x 14 " Paper Capacity • Reliable - No Jam Straight Through Paper Path • 100 sheet Input/Output Tray • 5000 Sheet Toner Cartridge • 1 year Warranty and Nationwide Post Warranty Service by Genicom

Physical Specs: • 11.5 " x 17.1 " x 17.7 " (H x W x D) • Weight 66 lbs

About The Manufacturer

Centronics (the developer of the universally used Centronics Parallel Interface) has been a recognized leader in the design and manufacture of high end high quality printers for for over 20 years. Centronics was recently acquired by Genicom (formerly a division of GE) which has led the industry in innovateive technology since it introduced the worlds first electronic printer in 1969. The printer is warranted by Genicom

HP Emulation

Option Package

1.5 Additional RAM (Total 2.0 RAM)

With this option the Page Printer 8 will Emulate the HP LaserJet Plus making it 100% compatible with all Desktop Publishing and other software designed which supports the HP Laser Jet Plus. The additional 1.5 Meg RAM, (toal RAM 2.0) means you have lots of memory for full page bit map graphics. The entire option package costs only an additional $349 (less than the cost of the additional memory alone.)

"The Page Printer 8 is a stupendous value at $2000! Its inexpensive rugged and compatible"

"This has the crispest most well defined print of any three hundred dot per inch printer I've yet encountered."

–COMPUTING NOW!
December 1987

Product #	Item	Price	Shipping& Handling
LP8-CS11	*Genicom Page Printer 8 with Epson FX-80 emulation and .5-MB RAM*	*$799*	*$59*
LP8HP-CS11	*Genicom Page Printer 8 with HP Laser Jet P emulation and 2.0 MB RAM*	*$1148*	*$59*

7 Color Graphics Printer

$89

Made by **SEIKOSHA** for another manufacturer
Same as **SEIKOSHA GP7000**

Mfr. Retail ~~$599.00~~

- 4 Color Ribbon Combines to Print in Red, Yellow, Green, Purple, Cyan, Magenta, Black and many combinations and shades.
- Centronics Parallel Interface.
- Optional Serial Interface.
- Special Interface Card Available for Use with Apple II/IIe/II+ Computers.
- Impact Dot Matrix Printing.
- Pin Feed and Friction Feed.

SPECIAL---Graphics Software

For IBM Compatibles

Designed especially for this printer

Lets You Print Whatever is On Your Screen!

Supports 13 graphics boards including EGA •RAM resident-call up software within your application program • On-screen menu lets you rotate, enlarge, and reduce images. Print only a portion of the screen, and smooth out jagged edges. *Only $9 with printer order!*

Product #	Item	Price	Shipping& Handling
GP700-CS11	*7 Color Printer*	*$89*	*$14*
GR750-CS11	*Graphics Software for IBM Compatibles*	*$9*	FREE WITH PRINTER ORDER
GP799-CS11	*Interface Card for Apple II/IIe/II+ Computers*	*$9*	
RB101-CS11	*Replacement Ribbon for Printer*	*$15*	
IM101-CS11	*Ribbon Inker for Printer*	*$11*	
SERIN-CS11	*Serial Interface*	*$9*	

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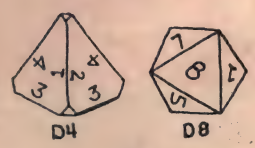
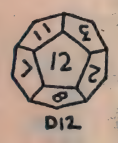
BASIC Backpack continued from page 324

Problem 23. A Dice Game -- Solution Hint

Mayfair Games (P.O. Box 48539, Niles, IL 60648) sells a set of five rather pretty dice called GEMSTONES. Packaged with the dice is a nice strategy game. Here is a simpler game based on the GEMSTONES idea. In this game, you use three dice: D4 (four-sided), D8 (eight-sided), and D12 (12-sided). Any number of people can play.





The players each roll the D12 (12-sided die). The player with the highest roll goes first. Of course, you can agree that the player with the lowest roll goes first. Play goes clockwise around the table, or counter clockwise, or in the order you all agree on.

The first player rolls all three dice, chooses the number shown on one of the dice, and writes that number as part of her score. Each player does the same.

Then, each player rolls two dice, excluding the die she or he chose the first time, chooses the number on one of the two dice, and records that number on the score sheet.

On the third (and final) roll, each player rolls the die not chosen the first two times and records the score.

Joleen's Score Sheet

	1	2	3	4
D4				
D8				
D12				
TOTAL				

Player's score sheet for four rounds of play. Play as many rounds as you want.

That's the end of round one. Each player totals her score. Now play another round and another, as many rounds as you wish. We show a score sheet for four rounds, but you decide how many rounds to play. Winner is the person with the highest total score over all rounds played.

Design a strategy for playing. Try it by playing many solitaire games using your strategy and computing the average score for the rounds played. Use a computer to simulate a strategy and play thousands of simulated games. This is a much-used technique in operations research.

Try this strategy: Each time, select the highest number that occurs on any die. Roll all three dice and take the one with the highest score. Roll the remaining two dice and take the one with the highest score. Roll the one and only remaining die and take its score. Write a program to do this thousands of times and print the average score over all simulated plays. Oops, almost forgot -- be sure to do something about the situation where two or all three dice tie for high.

Another strategy: Each time, select the die with the highest ratio of its potential. For example, if you roll D4 = 3, D8 = 4, and D12 = 7, the ratios are 3/4, 4/8, and 7/12, respectively. Take D4. Write a program to use this strategy thousands of times and print the average score for one round.

Problem 50. Pick the Lottery Winner -- Solution Hints

In the California Lottery, you try to guess six numbers, different from one another, in the range 1 to 49. After the people have been milked for a few million guesses at a buck a shot, someone or something (a computer?) chooses the winning numbers.

Write a program to choose, at random, six numbers in the range 1 to 49. REMEMBER, your program must choose six different numbers -- no two numbers can be the same. A run might be as simple as this:

The winning numbers are: 23 6 42 17 14 32

This problem sure did generate a lot of responses! Many people are already on to the next problem, generating many sets of six numbers with no two numbers within a set the same, and no two sets the same.

Here are some ways to do this problem, in which we want only one set of six numbers with no two numbers the same.

- Generate an array of numbers from 1 to 49 (in order), scramble the array, then take the first six numbers in the scrambled array. You can modify program YBB1501G.BAS to do this.

- Generate an array of 49 zeros. Each array element is zero. Pick the first lottery number at random. Suppose it is 23. put -1 in array element 23, replacing the zero that was there. Pick five more numbers, but check each one against its corresponding array element. If the array element is zero, it is OK to pick that number. However, if the array element is -1, that number has already been picked. For each number you take, put -1 into its array element. When you finish, six array elements will be -1, the rest will still be zero (0).

- Build an array of six winning numbers selected at random from 1 to 49. For each pick, compare it with any numbers already picked and reject any number already in the array of winning numbers.

- Use the upper case letters A to Z and the lower case letters a to w to represent the 49 numbers, as follows:

  A = 1 B = 2 C = 3 D = 4 E = 5 ... Z = 26

  a = 27 b = 28 c = 29 d = 30 e = 31 ... w = 49

  Build a string of six of the above characters selected at random. For each pick, use the INSTR function to see if that character has already been picked. Reject any character already picked.

  Or use ASCII characters from, for example, ASCII code 33 (!) to ASCII code 91 ([) to represent the numbers 1 to 49. Or you pick a set of 49 ASCII characters to represent 1 to 49.

Whatever method you use, one of the above or one of your own, also consider presenting the winning numbers in numerical order from smallest to largest:

6 14 17 23 32 42

Good luck!

New Problems

Well, here are more problems. We have hundreds of problems tucked away in various files and piles of paper. And we can invent many more. What kinds of problems would you like?

Problem 54. The Morning Paper -- Average Time Late

Since moving to Sebastopol, we have encountered a problem in delivery of the morning paper. Back in Menlo Park, the San Jose Mercury News usually arrived between 5:30 and 6:00 AM, about the time we like to get up. So, with high expectations, we called to arrange delivery of the morning paper to our new home.

The circulation people assured us that the paper would be delivered by 6 AM. Great! Just right. We can drink a little coffee, read the paper, then plunge into the day's writing projects. Unfortunately, the paper never came by 6 AM, or even 6:30 AM. Here is a typical week's worth of arrival times:

7:12 6:45 7:37 6:33 6:58 8:15 7:46

Hmmm... what is the average time late? Write a program to allow entry of any number of arrival times, then compute and print the average time late (or early if you're more fortunate). It might go like this:

```
Expected arrival time is 6:00.  Enter actual arrival time
as requested.  To quit, press ENTER without typing a time.

Arrival time? 7:12
Arrival time? 6:45
Arrival time? 7:37
Arrival time? 6:33
Arrival time? 6:58
Arrival time? 8:15
Arrival time? 7:46
Arrival time?

Average arrival time is 78 minutes late.
```

To simplify your work, assume that the latest arrival time to be included is 12:00 (noon) and the earliest is 5 AM (5:00). You decide whether 7 o'clock can be entered as 7 or must be entered as 7:00. Of course, 7:07 should not be entered as 7:7. The number of minutes must be in the range, 00 to 59. And so on -- put in whatever checks and balances you want.

DragonSmoke

Back Issues of YBB. Full-sized (8 1/2 x 11) copies of "Your BASIC Backpack" are available for those of you who missed an episode or two, or don't have hyperscopic eyes. We will make copies and send them to you, as follows:

Number 1	Sep '87	$2.00
Numbers 2, 3, 4	Oct-Dec '87	2.50 each
Numbers 5-15	Jan-Nov '88	3.00 each

Prices include paper, toner, wear & tear on our trusty Canon copier, our time spent slaving over a hot copy machine, envelope, and first class postage. Order from **Different Worlds, 2814 - 19th St., San Francisco, CA 94110.**

The BASIC Teacher is our magazine about learning and teaching BASIC. For a FREE copy, write to the publisher, Tadashi Ehara, Different Worlds, 2814 - 19th Street, San Francisco, CA 94110. Please allow 6 to 8 weeks delivery or send $1 for first class mail. If you are a parent of a 6th to 12th grade student, we suggest learning BASIC together as a mutually beneficial activity!

The BASIC Teacher

Play Together, Learn Together. We are running FREE play-by-mail games for kids in grades 4 thru 6. These games require both strategy and diplomacy. To play successfully, you must write to, and cooperate with, other players. There is no game fee -- your only costs will be paper, envelopes, and postage. Want to play? To find out how, send a self-addressed, stamped envelope to Adventures in Learning, P.O. Box 1635, Sebastopol, CA 95473. It's Ok for a kid and parent to play together, learn together. Also Ok for a teacher and a bunch of kids to enter as a team.

A Computer in Hand Is Worth Two on a Desk

We have received four MS-DOS laptop computers for evaluation. Two of them are suitable for our purposes and priced right: The Datavue Spark and the Toshiba T1000.

The Toshiba T1000 has a feature we would like to see in all computers to be used by people who are not computer professionals: MS-DOS is in ROM. Makes a single drive system very practical. The T1000 has enuff RAM (512K) to run the software we like to use: GW-BASIC, QuickBASIC, Microsoft Works, Tandy Deskmate, and tons of shareware. It has the right stuff packed into the right size -- a 6.4 pound package small enough to put in a backpack. We see the T1000 advertised for $725 in lots of places -- definitely a bargain.

We also like the Datavue Spark, but haven't yet checked it out thoroughly. Our evaluation copy has 384K RAM, enough to run GW-BASIC, QuickBASIC and Tandy Deskmate, but not enough to run Microsoft Works. Tell you more about the Spark next time.

T/Maker's ClickArt
continued from page 575

This is an intelligent art manager that allows you to store and organize graphic images in both a visual and labeled way. You can create miniature copies of images in a file, scan through them, and then double-click on any desired image and bring it to screen in a life-size manner.

For use with MacPaint, there's ClickArt Effects ($49.95). This allows you to rotate an image as little as one pixel at a time, or slant an image or text backwards or forwards, up or down. In addition, you can add perspective by enlarging or compressing the background or foreground to give the appearance that it is receding into the distance; and distort an image or text so that it becomes "elastic." The effects you can achieve with this package are fascinating.

The final group of T/Maker products are 5 different ClickArt fonts and typefaces for the Macintosh. They're elegant, and range from 24 to 72 points. Some of these typefaces are for the LaserWriter or other PostScript compatible printers, and may be used in gray, bold, italic, underline, and shadow styles. These packages are priced from $49.95 to $79.95.

ClickArt Image Portfolios offer professional-quality graphics which are well-documented and easy to use.

For additional information, please contact T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043; (415) 962-0195. ●

Grayscaler II
continued from page 572

pretation is done internally in the Grayscaler. Therefore, depending on your intended usage, you may order the Grayscaler II (or the Grayscaler I, described later) in either the word processing or imaging version, with no cost difference. The word processing version (Table I) is shipped if not otherwise specified.

Testing Grayscaler II

Installing the Grayscaler II was just as simple as plugging it into the CGA card and composite monitor cable. I tried two composite monitors—a Comrex CR-5400 amber, and a TAXAN KG-12NU-N green. They both worked fine.

I was particularly interested in trying programs that boot-up in CGA, with no Hercules choice. With these you must use a CGA board, and the monochrome output is usually marginal at best. In fact, even those with Hercules as an option are usually not great in high-resolution monochrome.

I tried MicroProse's Hellcat Ace with Grayscaler II and was delighted. Although this is one of my favorite flight simulator programs, it boots in CGA, has no Hercules option, and some color screens are hard to read. However, with Grayscaler II, the selection screens were actually much more readable!

I also tried MicroProse's F-15 Strike Eagle, and found all the screens produced by Grayscaler II to be very sharp and readable.

Just to see if there were really 16 gray levels I wrote a simple program (Listing 1 on page 570). The Grayscaler User Guide has a much more sophisticated program, but I like to keep things simple. When you run the program, you must adjust the monitor color and brightness for the best display, with all colors (except black) represented by a brightness.

As expected, I had the word processing version of the Grayscaler II, since the brightness levels did not follow in sequence. The brightness levels of colors 8-11 and 12-15 were out of order, as shown in Table 1.

However, just to see the difference, I made a slight change in my program (Listing 2 on page 570) and got all 16 levels of brightness in order. To verify that there were indeed 16 levels, I turned the monitor brightness level down until all images disappeared. As I slowly increased the brightness, each color appeared in sequence. Perfect!

Figure 2 on page 571, if held at a distance, shows a gray-level picture of Abraham Lincoln.

Dos And Don'ts

The Grayscaler II will work with any composite monochrome monitor, but not with IBM's TTL monochrome monitor, or any of the TTL compatible monitors. The IBM monitor was designed specifically for text and is congenitally incapable of displaying more than four shades of gray. Furthermore, since the resolution is set by the color graphics card rather than the monitor, it has no advantage over an ordinary green screen in this class of service.

Since the Grayscaler II appears to the system as an RGB monitor, if your system can drive an RGB monitor, it can use the Grayscaler II. All modes and features will work normally. The choice of monitor makes little or no difference as long as it can connect to the phono jack output. In fact, the Grayscaler II is an excellent way to provide a phono jack if your card lacks one. The choice of green, amber, or white for the monitor screen is strictly a matter of taste. They all work well.

You may wonder about plugging the 9-pin connector of the Grayscaler II into the 9-pin socket on your high resolution or similar monochrome card. It will fit, but it won't work. The video signal generated by the high resolution adapter is non-standard in order to achieve the resolution increase. It is technically incompatible with the Grayscaler II, although connecting it to the card is harmless.

Grayscaler I

Since Grayscaler II steals power from the CGA card jack to operate its internal circuitry, it only can support one display. If you wish to drive more than one display, you'll need a Grayscaler I, which sells for $59.95. This requires +5 volts at 10-15 milliamps, easily available from the CGA board or an external supply.

For more information contact Avocado Computer, Box 632, Yorba Linda, CA 92686; 714-528-1025. ●

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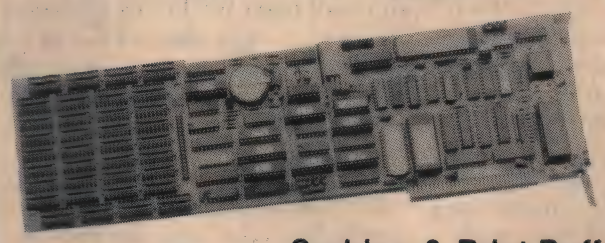

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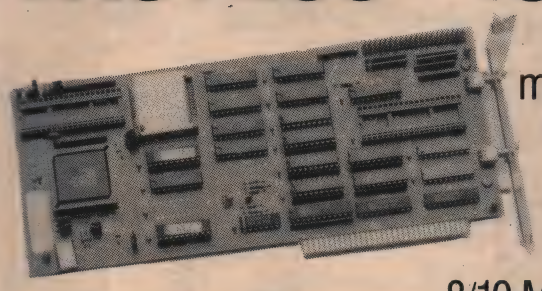

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Show Partner: Lights, Camera, Action!

Reviewed by Ron Albright

Business graphics has assumed a "hot topic" status in the computer world, probably second only to desktop publishing. With the advent of the large-screen, high-resolution monitors, overhead LCD projectors, and instant slide developing software and hardware, putting together an eye-popping presentation in hours instead of days is now possible.

But what do you use for your graphics software? Early on, there were few choices. You had to be content to use the pie-charts or bar-graphs that Lotus 1,2,3 generated. Later, such charting packages as Harvard Graphics, Ashton-Tate's Draw Applause, and Microsoft Chart allowed you to take your figures and add higher resolution, color enhancements and fonts galore. You could then take the files created and send them by disk or modem to graphics laboratories for custom 35mm slides or you could produce them locally using Polaroid Palette or similar equipment.

Something Was Missing

PC users wanted more. Why should they be limited to using the computer simply to generate graphics for reproduction on other media? Why not use the computer as the medium itself? The computer could create the whole show and allow the presenter to interact with the show to branch to different images based on the audience responses. The software will enhance the traditionally-static slide shows with screen wipes, fades, and even animation. Finally, "presentation graphics," a whole new variety of software, has arrived.

Perhaps the best software in the family is Show Partner from Brightbill-Roberts. The five program modules that come with the package enable you to produce stunning graphics and integrate them into sophisticated shows that incorporate features available in no other package. The capabilities of Show Partner are such that it was chosen to produce PC Life (Microstar Graphics, 1201 East Fayette St., Syracuse, NY 13210; $34.95 for 6 issues), magazine-on-disk for the PC world.

Five Is Enough

The software comes as 3 floppy disks or two 3½" disks, your choice. Installing the software to hard disk or floppy is simply a matter of running a setup program which prompts you for a few system parameters and then holds your hand through copying the necessary files to where they need to go. A demo is included on the disk which is not only instructive but also highlights the many features of Show Partner. It can't really be called a "tutorial," but it does explain how the software is set up.

You will probably want to start with capturing some screens from other applications. You simply load the Capture program into memory and you are ready to grab anything on your screen. Whether the application relies on characters (such as dBase III or Lotus 1,2,3) or graphics modes for their screen displays, Capture can handle them. Simply get to the display you want within your application, press "CTRL-ALT-MINUS," and give the screen a disk name, and the image is captured and stored in a ".GX1" file. Files saved in this manner can then be manipulated or shown by Show Partner's other modules.

The second step is to use the graphics editor to enhance captured screens or generate new screens. The GED module offers most of the usual draw and paint functions of dedicated graphics programs. Through its simple drop-down menus (see Figure 1), GED can load captured screens and add art or text anywhere you desire. GED works well

continued on page 583

Figure 1—The Show Partner "Graphics Editor"

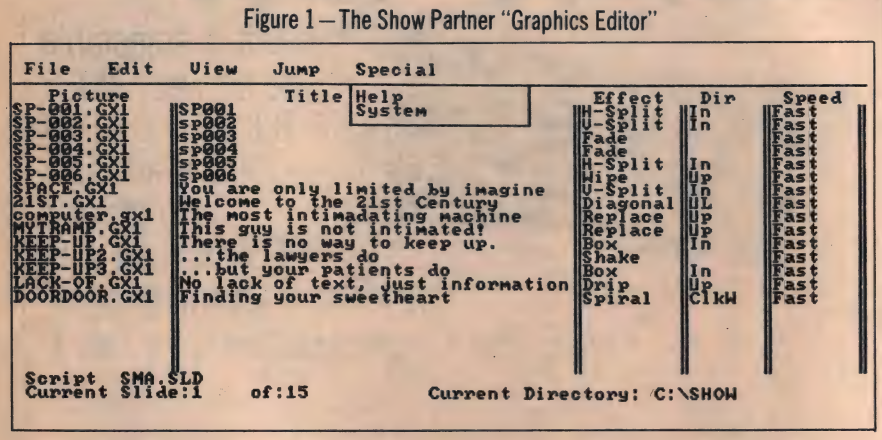
File Edit View Jump Special
Picture Title Help System Effect Dir Speed
SP-001.GX1 SP001 H-Split In Fast
SP-002.GX1 sp002 V-Split In Fast
SP-003.GX1 sp003 Fade Fast
SP-004.GX1 sp004 Fade Fast
SP-005.GX1 sp005 H-Split In Fast
SP-006.GX1 sp006 Wipe Up Fast
SPACE.GX1 You are only limited by imagine V-Split In Fast
21ST.GX1 Welcome to the 21st Century Diagonal UL Fast
computer.gx1 The most intimadating machine Replace Up Fast
MYTRAMP.GX1 This guy is not intimated! Replace Up Fast
KEEP-UP.GX1 There is no way to keep up. Box In Fast
KEEP-UP2.GX1 ...the lawyers do Shake Fast
KEEP-UP3.GX1 ...but your patients do Box In Fast
LACK-OF.GX1 No lack of text, just information Drip Up Fast
DOORDOOR.GX1 Finding your sweetheart Spiral ClkW Fast
Script SMA.SLD
Current Slide:1 of:15 Current Directory: C:\SHOW

Figure 2—The Show Partner "Slide Show Editor"

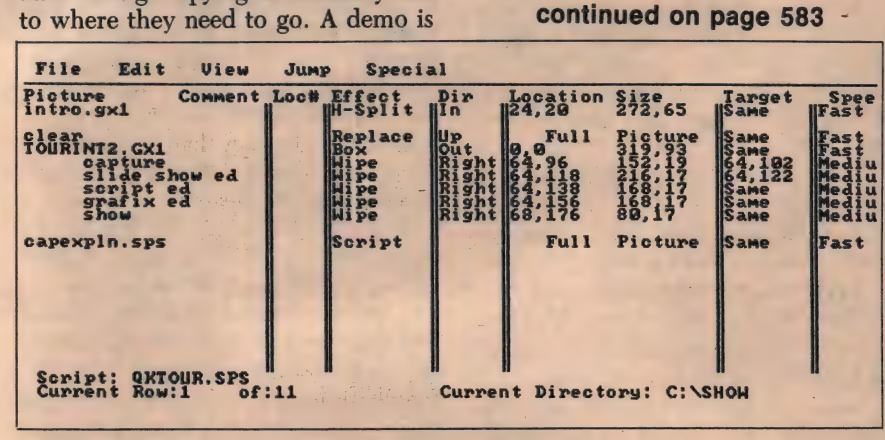
File Edit View Jump Special
Picture Comment Loc# Effect Dir Location Size Target Spee
intro.gx1 H-Split In 24,20 272,65 Same Fast
clear Replace Up Full Picture Same Fast
TOURINT2.GX1 Box Out 0,0 319,93 Same Fast
capture Wipe Right 64,96 152,19 64,102 Mediu
slide show ed Wipe Right 64,118 216,17 64,122 Mediu
script ed Wipe Right 64,138 168,17 Same Mediu
grafix ed Wipe Right 64,156 168,17 Same Mediu
show Wipe Right 68,176 80,17 Same Mediu
capexpln.sps Script Full Picture Same Fast
Script: QKTOUR.SPS
Current Row:1 of:11 Current Directory: C:\SHOW

Figure 3—The Show Partner "Script Editor"

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Q & A 3.0: Database, Word Processing & Assistant In A Box

by Michael Cortese

Q & A 3.0 is the latest release of a powerful database package from Symantec. The $350 program is an ideal tool for most database applications, and is extremely easy to use. A unique intelligent assistant allows you to type English commands to accomplish most tasks, and an integrated word processor makes mail merge documents very easy to create. The program is broken down into five modules: File. Report, Write, Assistant and Utilities. Each of the modules can be selected from the main menu of the program.

The package comes with two spiral bound manuals, which fully explain all of the programs options. The manuals contain an excellent index and are logically organized. In addition, a quick reference booklet, a getting started booklet and a reference guide for look-up commands are included. A keyboard template is also included. The manual is a good tutor, and the program is easy to use because of it's intuitiveness, pop-up menus and built-in help screens. The program comes on seven 5¼" disks and a coupon is enclosed to exchange them for 3.5" disks if you need them. The program requires 512K memory to operate, and a hard disk is highly recommended. Although the program can be run on a dual floppy system, disk swapping is frequent, and the program becomes very cumbersome to use. Installing the Q & A on a hard disk requires copying six of the floppy disks. It will use about 1.5 megabytes of your hard drive space.

All of the modules share some common features. Most options in the program use pop-up menus to make selections. Pressing escape returns you to the previous menu. There are also function key options listed at the bottom of the screen for common tasks. Pressing F1 at anytime will bring up a help screen pertaining to the current module, and the task you are attempting. The help screens are extensive, and also list page number references for the manual. The common intuitive interface of Q & A makes it easy to learn and quick to use. Also common to all of the modules are keyboard macros. Pressing Shift-F2 at anytime calls up a menu that lets you define, load, save, or clear macros. You can define almost any key on the keyboard by itself, with shift, with control, or with the alternative key. You can define the key(s) as one keystroke or a series of keystrokes. Macros can also be imbedded within each other. Although you can manually load macros from disk, the program will automatically load the macro file "QAMACRO.ASC" each time you start Q & A. You can also use the Write module of Q & A to edit or create macro files.

Another nice feature, in all of the modules, is the list files option. Whenever you try to load or save a file, you can get a list of all the files in a directory by pressing return with a blank file name. This will bring up columns of the file names in the directory you specified (the default is the current directory), and allow you to select one by highlighting it with the cursor keys and pressing return—a handy feature if you forget the exact name of your file.

Included on a separate disk is a tutor program. It interacts with the Q & A program and shows you how to use most of the programs basic features, and some advanced features, through examples. It tells you what to type, and explains what it does. It consists of several lessons which can be completed consecutively, or individually. The program asks you to type certain things and helps you type it correctly, by ignoring incorrect key presses. You can also press the space bar, to avoid typing manually. The tutor was an excellent teacher for some of the lessons, but locked up in several of them. I attempted to complete the lesson on reports three times, but the program locked up every time. The lessons that work do a good job of explaining things. Since the manual also acts as a tutor, the tutor program is not mandatory. None of the lock-up problems associated with the tutor program occur in Q & A. In all of my use, the program has not crashed once—a difficult feat for a new release of a program of its size.

The File module of the program is mainly used for creating databases, entering data, and searching forms. On selecting the File option from the main menu, a sub-menu pops-up and presents you with the options. To create a database you select "Design File" and choose a file name. An almost blank screen appears (function key definitions are along the bottom), and you simply type labels for your fields. You follow your fields with a colon to indicate that its length will run until the next field (even over multiple lines) or use < and > to restrict the field length. You can have multiple fields on one line, and position every field exactly where you want it. Options also allow you to draw lines or boxes, center lines, and set tabs. Your forms can contain 10 separate pages (accessed with the page-up and page-down keys), 218 fields per page, 1,673 characters per field, and 16 million records (forms) per file (database). When you have completed your form definition, you press F10 (the continue key in all modules) and you assign information types. Information types let you restrict your fields to data of text, number, money, keyword, date, hours, or yes/no types. Though most are self-explanatory, the keyword information type allows you to enter words or phrases separated by semicolons into one field, and then search for them individually. In an example database, the keywords information type is used for a field that lists hobbies of people. Assigning the information types merely requires pressing the first letter of the information type and going on to the next field. All of the information types are shown on the screen for you. You can also specify if you want data to be displayed centered, right justified, in uppercase letter only, with commas (for numbers), and the number of decimal places (for numbers). If you have any fields of type date, hours, number, or money, a global format options screen appears. This allows you to select choices for date, number and currency field for-

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Show Partner

continued from page 582

from just the keyboard or can use a mouse. You call up the menu bar with the DELete key or the right mouse button. The file menus enable you to load or save screens. Edit allows you to cut, copy, move, zoom in for pixel-by-pixel drawing, upend (flip a block on its horizontal axis), reflect (produce a mirror image of a block), rotate a block 90 degrees, center a block, or work with a second screen and clip blocks from it to the main (first) screen. The draw section has the traditional circle, box, and paint functions. Color offers the ability to select or change the colors used in your display and select patterns for filling. With mode you can move between two different resolutions. For example, on my EGA monitor, I can switch between 4-color CGA mode to 16-color EGA mode. In the special menu division, you can choose text fonts (20 are offered), with three different sizes and slants (right, left, or normal) for each font. You can also expand or shrink blocks and change cursor speed.

The Show Must Go On

Once you have created or modified your screens, it's time to put your director's cap on and build your show. You have two ways to go here. The simplest option is to use the Slide Show Editor to build your presentation (see Figure 2, page 582). The interface with SLED is consistent with the GED module described earlier. The sections of SLED allow you to name the screen files you want presented and the order to present them in. You can then define the effects used to move from slide to slide, the direction you want the effect to take place, the speed with which the effect happens, and the duration between slides. The effects offer an immense array of technical marvels. You are given fourteen different ways to change screens. From simple horizontal, vertical, and diagonal wipes to beautiful fades, spiral wipes, or shake and drip special effects, you can make your shows come alive. You can even use special effects to simulate motion and animation.

presentation is through the Script Editor (or SED-see Figure 3, page 582). While using the Slide Show Editor is simple, the Script Editor requires some serious study. But the extra work will pay dividends. With it, you actually program the show with all the jumps and loops necessary to make a show that is truly dynamic and interactive. You can link scripts together and jump to any picture in the script, based on which key is pressed on a keyboard. You can also control, pixel-by-pixel, where the screens are displayed, where they move to, and how fast you want them to get there. You can even run other DOS programs from a script. I began putting shows together with the SLED but, after a little practice, I now use the Script Editor exclusively.

The Curtain Goes Up

When your slide sequence is set up, either with SLED or SED, you are ready to reap the rewards. The run-time module is the Show program. Show simply reads the appropriate presentation file and puts the screens through the paces assigned with the editors. Show is license-free and can be used to drive a commercial application without a fee. You don't have to own Show Partner to view a demonstration produced by it. This feature makes producing your own software tutorials a real temptation. Included with the package is an offer by one graphics firm to make 35mm slides directly from saved .GIF files. Just send them a disk and your slides are sent back within days. Life for the trainer is getting easier and easier.

Final Comments

It's rare for me to review a program that I don't have some qualms about, but Show Partner is one of the exceptions. I used Show Partner in tandem with a Kodak DataShow overhead LCD display and ran the package off a Toshiba 1000 to teach several computer classes and I can honestly say that I encountered no problems whatsoever. My only complaint about Show Partner is its inability to directly import graphics produced by other programs. It will not import PC Paintbrush, CompuServe .GIF, or MacPaint files. But that can be overcome by displaying them in their native software, and then capturing the screen and modifying them with Show Partner's GED. Other than that minor limitation, I can strongly recommend Show Partner for anyone who needs a tool for putting together business or scholarly presentations, using sophisticated computer graphics.

Summary: Show Partner (Brighthill-Roberts, 120 E. Washington St., Syracuse, NY 13202; (315) 474-3400; $99.00 plus shipping) is a sophisticated presentation software package that is exceedingly full-featured and easy to use. It is highly recommended for anyone who must impress the boss (or anyone else) with quick, colorful, and animated demonstrations.

System requirements: IBM PC/XT/AT or compatible computer with graphics adapter, 256K, DOS 2.0 or higher, and at least one disk drive. Systems used for evaluation: Zenith AT clone, 512K, 20MB hard drive and EGA monitor; Toshiba T1000 with 512K and single 720K drive with Kodak DataShow. ●

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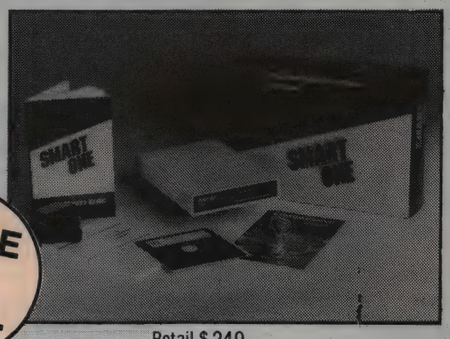

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Q & A 3.0
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mats. After you complete this step, your database is saved to disk, and you are ready to enter data.

The Add Data option on the file menu allows you to complete forms, and add them to your database. A blank form will appear on the screen with the labels (Name, Address, etc.), and you simply type in the data. You can move between fields with the return key, tab key, or cursor keys. You can also use any of the keystrokes from Write (the word processor) to delete characters or words. Shift-F4 deletes to the end of the line, and numerous other considerations make data entry painless. In number and money fields, only number, commas, periods, plus, minus, and currency symbols are allowed. In other fields after you leave the field it will alert you if you have typed an illegal entry (such as a name in a date field). The F5 key allows you to "Ditto" information from the previous form. It pulls the entry from the previous form into the field you're on, and puts it into the current form. Shift-F5 dittos the entire previous form, instead of just one field. F9 and F10 let you flip through the forms and enter, change, or look at data in forms entered previously. To print a form you're looking at you press F2 and a Print Options menu allows you to print the current form with labels and data. Other keys allow you to delete the current form and insert the time or date from the system clock. After you have entered your data into forms, you can use the search/update function to selectively view and change forms.

The search/update option is selected from the file menu and presents you with a search spec screen. It looks like a normal blank form, but allows you to restrict which forms you will retrieve. Leaving the form blank and pressing F10 (continue) allows you to use all forms. To restrict fields you can type specific things like "Smith" in the name field to find all forms for Smith, or use wildcards, greater than/less than (range), starts with, contains, is not empty, is empty, starts with or ends with. These can all be performed in complex statements containing AND, OR and NOT. You can also retrieve x number of forms with the highest or lowest values. The search capabilities are very extensive, yet easy to use. You just type in the restriction into the appropriate field. When all forms are found that match the search criteria, you can view them one by one, or in a table. The table view lists certain fields that you define on one row of a table—allowing you to see information from 17 forms at once. Forms are retrieved by default in roughly the order that you enter them. You can optionally choose to sort them. You can easily choose to sort on numerous fields by indicating a sort level on the retrieve spec screen. Unlike some databases, you can change or delete forms you retrieve with the search option—you are not restricted to just viewing the forms. Overall, the search functions are extensive and very competent, and do not require complicated programming.

The print option on the file menu allows you to print mailing labels, print on reprinted forms, or print information to any x,y coordinate of the page. The simple print option should not be confused with the report module which produces columnar reports with calculations. The first option allows you to design/redesign a spec. A print spec consists of a retrieve spec to specify which forms to print, a field spec which specifies which fields to print and where they should appear on the page, and print options (optional). The retrieve spec is exactly the same as you use in the search option of the file module. Though more advanced options are available, the field spec just requires placing an "x" or " + " in the fields to be printed. The print options menu allows you to choose to print to one of five printers (chosen from the utilities module), disk, or screen. You can also choose paper type (manual, continuous or bin), printer offset, control codes, number of copies, number of forms per page, and number of labels across. Pressing F8 also allows you to define the page. You can change the dimensions, spacing, and other page characteristics. Note that the print options screen is available when you print in any module. When you finish designing your print spec, it will be saved to disk. The next option of the print menu allows you to print forms using an already defined print spec. You can also define a temporary spec that won't be saved to disk. The global options menu allows you to change the default print options—they are saved to disk and used for print specs created in the future.

The customize a file option will allow you to fine tune your database to your specifications. It allows you to format values, restrict values, set initial (default) values, speed up searches (index), program a form, construct a look-up table, set colors, assign access rights (passwords) and define customized help screens. As you can see, this is where the power of the database lies. All of these features can be implemented by selecting them from the customize a file menu. Since they are the most powerful, I will concentrate on the programming functions. You select the program function and a blank form appears. Now you can enter programming statements that calculate values for certain fields, look-up information from a table or other database, and automate other functions for your particular database. The program commands are very easy to use, and can be quite complex, even including If-Then-Else statements. Calculations like totaling certain fields in another are extremely easy to implement. There are two look-up commands to retrieve information from an internal look-up table. The look-up table simply has columns and rows that you fill with data. Though only one table is allowed per database, it can contain unrelated information. For example, one column can contain sales tax information, another shipping charges. The look-up commands simply retrieve the data from the chart that meets your specifications. You can use this function to have a part name inserted into a field after the part number is entered. The other look-up function allows you to retrieve data from another database. This lends Q & A a lot of flexibility, because it is not a relational database and cannot use more than one file at a time (other than with the look-up command). Other functions available when programming calculate absolute values, averages, exponents, sum a list, perform financial functions, string functions, and time/date functions. Functions that let you compute things like compound growth rate, get parts of a text string, and return the ASCII value of a character make Q & A one of the most versatile data managers available.

Also from the customize a file menu, you can define custom help and assign access rights. Custom help can be defined for each field in your database to aid the data entry person. For example, a list of state abbreviations could be put into a help screen for a STATE field. These help screens are brought up whenever F1 is pressed. If there are general help screens available (the ones built into Q & A), they can be accessed by pressing the page-down key. The assign access rights option is useful for protecting your database on either a network or a single PC. You can assign each user an ID and also a password which will be required to do certain things. You can restrict reading and writing for reports and files. Before a user is allowed to access a protected function, the correct password must be supplied. Other options available in the file module allow copying, deleting, and backing up forms. A mass update option allows you to change information on a group of forms.

The Report module of Q & A allows you to create and print reports based on your database. To produce a report you need to select the forms and fields to use, select the columns and sorting order, define calculations, define print options, and then print the report. To select the forms you want to include in your report, you use the same retrieve spec screen you use for searching. Then you enter a column/order spec by

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numbering the fields for columns, and indicating ascending or descending order for sorting. You can also indicate column breaks and page breaks. Headers, footers, totals, subtotals, averages, and other calculations can easily be included in your reports. You can also indicate your own formulas to calculate something in your report. The same look-up options available when you program a form are also available for your reports. The report module is quite flexible for tabular reports, but does not allow you to screen paint a report. If you want to produce a customized report with totals, you will have to look elsewhere.

The intelligent assistant module is a unique module that allows you to type English commands to accomplish many database functions. The assistant can prepare reports, fill in a form, make changes to forms, make calculations and answer questions about who, what, when, or how in regard to your database. The intelligent assistant is very powerful because of its versatility, and ease of use. It makes things easy for the inexperienced database user, and quick for the experienced database user. It is also fun to watch the intelligent assistant try to decipher your commands. Before you can start asking the assistant questions, you have to teach it a few things. The get acquainted option gives you a few pages of information about the assistant. The teach option lets you tell the assistant about your database. You can start by telling the assistant what your database is about—people, places, customers, etc. The next step is identifying which fields you want shown each time you ask a question. Since you can only have one screen line (80 characters) when viewing a table, you indicate the most important fields you want shown. You can also view the data as a form, but then you only see one form per screen. Other lessons let you teach the assistant which fields contain people's names, indicate units of measure, teach adjectives, and teach verbs. You can also use the synonyms option to indicate synonyms for some of the fields in your database, or for some of the assistants 450 built in words. The teaching process can take some time, but it is not difficult. Each time you teach it something, it is saved to disk and remembered for the next session. After you're done teaching the assistant the basics about your database, you're ready to start asking questions. The assistant uses advanced artifical intelligence to decipher your commands, and perform the requested task. You type your commands in a multi-line box at the top of the screen. All Q & A editing options are available. When you press return, the assistant will attempt to decipher your request, and present you with a list of things it thinks you want it to do. You can confirm it by pressing return, or choose not to have the assistant perform the tasks. If the assistant does not completely understand your questions, it will ask you what you mean and give you menu choices, or tell you it simply does not understand and to rephrase your request. Overall, the assistant does a good job of interpreting what you want. You can ask "Show me all the forms for sales people in CA and list them alphabetically." You can also make follow up requests like "what are their salaries?" Calculations like "what is 56 plus 60?" are no problem. You can make requests like "Increase John Smith's salary by $5000 and change his department to accounting." You can also make definitions to use in your requests like "define total commission as sales * .12" and then ask "what was the commission for Jones?" You can run reports, view forms, and fill in forms. If you make an ambiguous request like "show me the highest," it will ask you if you mean highest salary, commission, or whatever fields can hold numbers. A cute feature allows you to actually name the assistant. You can type something like "your name is Joe," and from now on you can refer to the assistant as Joe. Even the main menu will list the option "Joe" instead of Assistant. The flexibility and ease of use of the assistant make it a powerful addition to this package. It is also a unique use of artificial intelligence and you won't find anything like it in any other database.

The utilities module of Q & A performs imports and exports of databases, DOS file functions, printer installation, database recovery, and sets directories and alternate programs. You can import data from dBase II/III, .DIF, Fixed ACSII, IBM Filing Assistant, Lotus 1-2-3/Symphony, pfs:File, and standard ASCII. You can export data to .DIF, standard ASCII, fixed ASCII, dBase II, or dBase III. Installing your printer merely requires selecting your printer from 192 on screen choices. All popular printers are supported, with special attention given to laser printers. You can install up to five printers. The DOS file facilities allows you to copy, rename, and delete files. You can highlight the file name and choose an option, similar to the Word Perfect list Files function. The set global options allows you to specify default paths for document files and database files. A nice feature of Q & A is the ability to install up to six alternate applications. You can run any of the installed applications by simply selecting it from the main Q & A menu. This allows you to use Q & A and programs such as Lotus 1-2-3 or dBase like integrated packages. Q & A unloads itself from memory to provide room for the other application, and then reloads itself when you are finished with the other application. This feature saves you the hassle of exiting Q & A running the alternate program, exiting that, and then running Q & A again.

Write, the word processing module of Q & A, allows you to create documents and do mail merges. The Write menu offers you options to type/edit, define a page, print, clear, get, save, use utilities, and print mailing labels. Selecting the type/edit option brings you to the actual editing screen. It has solid vertical lines on both sides of the screen, a ruler about one inch off the bottom of the screen, an information line, and a line with function key assignments. The lines on the sides of the screen represent the actual edge of your paper. Write is a WYSIWYG (What You See Is What You Get) word processor, so margins and page breaks show actual spacing as it will apear on the printed page. The ruler line shows column numbers and where the margins are. The information line lists the file name (if it has been named), insert/typeover mode, the percent of memory free, the current line, the current page, and the total number of pages. Word wrap is automatic at the margins and page breaks are entered automatically when the page reaches the length you set it to. Page breaks are represented on the screen as horizontal lines across the width of the screen. Page breaks can also be entered manually. Pressing F8 gives you an option menu that lets you enter/edit headers or footers, set tabs, center/uncenter a line, insert (link) a document, insert a page break, and draw lines. Page number can easily be put into the multiline headers or footers. Pressing F1 at any time while in the editor will show you a help screen listing function key assignments for all of the function keys. Two other help screens tell you how to move through your document, and use special commands. An enhance text options allows you to use bold, underlined, subscripted, superscripted, italic, and striked-out text. It also lets you choose fonts available for your printer. You can also use WordStar editing commands in Write. Write also includes a 100,000 word spelling checker that can check individual words or the entire document. If it cannot find a word in its dictionary, it makes a guess as to what word you meant to type. You can also add words to the dictionary. To set dimensions, margins, and type size, you simply change the defaults on the define page screen. Print options are controlled through a screen similar to the print options menu found in the other modules of Q & A, except you can change the line spacing, and cannot print to screen. You can also justify the text you're printing, though it won't

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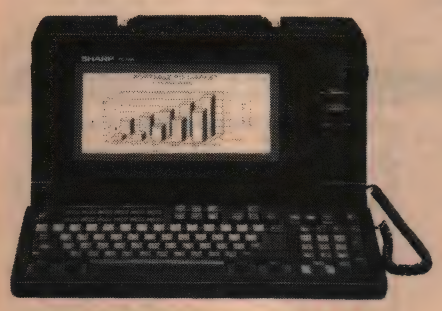

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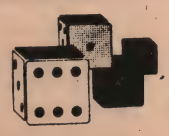

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Is Laser Toner Cartridge Refilling A Practical Solution?

by Fred Blechman

If you own a laser printer that uses a Canon Engine, you've probably been shocked to find that the regular price ranges from $95-$120 for a new laser printer cartridge, although discounts are generally available. You've noticed the increasing number of small ads in computer magazines that offer to recharge, refill or remanufacture your toner cartridges for $40-$50.

You've probably wondered what is really involved, and whether you could get the toner powder and do it yourself. Will it really save you money? Are you taking a chance of damaging your printer or copier? Will the copies be any good?

Based on my own experience, and a personal interview with someone in the business of refilling laser cartridges, this article will answer those and other questions.

Background

In the past few years I've used about ten toner cartridges. You can never tell exactly how long a cartridge will last, since this depends on the amount of toner and the density of the copies you make. The more printing on a page, the greater the amount of toner that is used.

A turn counter is built into the copier cartridge. This has a green/yellow/red scale that can be seen through a small window, and acts as a rough guide to cartridge life remaining. When you're in the red zone, it's time to have a replacement cartridge standing by. The real indication of replacement is when copies start having white streaks in the printed area.

At first I used original, new Canon toner cartridges. Although it was tough to get the cartridge apart (Canon uses special Torx screws) I took my first used toner cartridge apart to see what was inside. What a mess! The black toner inside is such a fine powder that it is impossible to control, and it gets on everything. Aside from a bunch of gears, screws, levers, springs, and the turn counter, there are four major parts—a main chamber that holds the fresh toner, a smaller chamber for the used toner, a drum with a special coating, and the cartridge shell.

It was obvious that this cartridge was not designed to be refilled by the user—and Canon offers no such service. Canon clearly intends to sell only new toner cartridges, despite the fact that most of the items in the cartridge could be used well beyond its rated 3000-4000 copies.

After taking one apart, I decided right then and there that refilling a used toner cartridge would take special know-how—and certainly a special screwdriver! I also later found out that it takes special toner, not generally available. That was about the time I spotted an ad offering to recharge toner cartridges for $35.

Toner Cartridge Recharging

My first experience with getting a cartridge recharged was with a company that picked up and delivered—even though they were 150 miles away! Very convenient for me, but not for them. As their business grew, they had to limit this pick up and delivery service to larger accounts than my occasional single cartridge.

I found that the reason they made the delivery themselves (instead of using UPS) was because the new toner leaked if the refilled cartridge was not handled very carefully and kept in a horizontal position. It seems that all they did was drill holes in the plastic chambers, shake out the old toner, add new toner, and cover the holes with black tape. Then, using a special Torx driver, they took off the end cap and reset the counter indicator to green.

Although the prints were not as dark as the original toner cartridges, and I had to clean the machine more often to prevent occasional streaking, I got more copies from these recharged cartridges than the originals, and they were good enough for rough work. When I needed good, dark prints I switched to an original cartridge rather than a refilled one.

When the pick up service stopped, they used UPS for delivery. This meant they could not put new toner in the cartridge or it would spill during UPS handling. Instead they just drilled holes, emptied the old toner, and sent you a plastic bottle of toner to put in yourself, plus a sticker to put over the fill hole! This turned out to be a mess and just not a satisfactory arrangement.

Another disadvantage of the drilled-hole approach to refilling a cartridge (as compared to disassembly) is that poorly covered holes can leak toner—and are obvious. If a repairman comes out under warranty and spots leaked

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appear justified on the screen. The search function has an optional replace mode, and supports wildcards. It is quick and easy to use. The maximum document size is limited by memory. On a 640K system, about 80 pages can be held in memory at one time. You can easily chain documents that are longer than this limit. Moving through the document is easy because of the logical key assignments. Deleting, copying, or moving a block of text is easily done by marking the block and indicating where it goes. Though you can only have one document in memory at one time, there is a clipboard to store text for cutting and pasting. Special functions allow you to import Lotus graphs or parts of Lotus spreadsheets. You can also do columnar math in your Write documents. The Write module of Q & A can easly compete with most stand-alone word processors. Though powerful, the Write module does not support outlining features, footnotes, endnotes, tables of contents generation, or index generation. Through a special offer you can order the Microlytics Word Finder Thesaurus for under $50.

Creating form letters using data from your database is incredibly easy. You press Alt-F7, and then enter the name of the database file you are going to use. A list will pop-up and you select the field you want to include in your document at the current cursor position. After the first time, you do not need to indicate the file name of the database. You can also manually type imbedded commands to make form letters. Having a built in word processor makes form letters incredibly simple to create in Q & A and makes Q & A more beneficial to most business users. Q & A offers many options to the database user. It does not have complex relational capabilities, but offers substitute look-up commands. Its programming functions are powerful and let you customize your database. The thought that went into the user interface that makes Q & A so easy to learn and use is uncommon in databases. The Write module is a definite plus for form letters and powerful on its own as a word processor. The intelligent assistant offers powerful artificial intelligence capabilities to use in aiding you in working with your databases. The unique features of Q & A make it all that much more powerful and easier to use, and a great program for a wide range of database and word processing applications. Symantec, 10201 Torre Ave., Cupertino, CA 95014. ●

Is Laser Toner
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toner and a cartridge with holes, he could charge for a service call.

Competition

Fortunately for us users, other entrepreneurs got into the act. However, they took a different approach. Some call it refilling, some call it remanufacturing—and some still call it recharging—but most seem to have abandoned the drill-holes-and-fill approach. Instead, they actually disassemble the main components of the cartridge. Parts are inspected and replaced if necessary (except the drum, since replacement drums are not currently available). The toner chambers are cleaned out with a vacuum or blower (or both). The main chamber is refilled with new toner, usually to a higher capacity than the original, thus yielding at least 20% more copies. Then the whole works is reassembled, including a plastic sealing strip to prevent leakage during shipping. When you want to use the cartridge, you just pull out the plastic strip, install the cartridge in your machine, and you're ready to print.

Laser Printers

In the last three years, laser printers have become very popular. Most of the early laser printers (now referred to as Series I) used the Canon CX Engine with a replacement cartridge almost identical in appearance to that used in the PC-10/20/25 series of Canon Personal Copiers.

Although the toner cartridges for the Canon PC copiers and the Series I laser printers look alike, they are really quite different. For one thing, they use toners of opposite polarity! Also, the PC cartridge uses a red internal filter while the Laser Series I cartridge uses a special shutter.

To identify which cartridge you have, look for a label to the left of the counter window. It will either say PC Cartridge for the copiers or EP Cartridge for the Series I laser printers.

The Series II laser printers, which use a Canon SX Engine, use an EPS Cartridge that is quite different in shape. For one thing, it holds about 20% more toner. However, the internal photoconductor drum is only about one-third the size of that used in the previous cartridges. Because the drum is smaller in diameter it makes more turns per copy, and doesn't last as long. More on that later.

An Expert Speaks

At a recent computer show, Jeffrey Graber, owner of Laser Refill (7272 Elmsbury Lane, West Hills, CA 91307. Phone: 818-999-1989 9am-5pm Pacific Time, Monday-Saturday) was offering information about his toner cartridge refilling service. Since his business is located only about five minutes from my home, I went over and interviewed Jeff about the whole laser toner cartridge refilling process, its advantages, and the hype that has developed. The rest of this article is based largely on information received from Jeff, and my own research.

The process used is a xerographic one—electrophotography of an image onto paper. Without going into a lot of technical detail, a drum in the cartridge is coated with a material that is sensitive to both light and an electrical charge. This is called the photoconductor. The drum is rotated and charged electrically over its entire surface. The surface is then discharged by light to create a charged latent image of what you want printed.

The rotating drum surface passes by the toner chamber and toner is attracted to the latent image. Next, paper comes in contact with the drum, the toner is transferred to the paper, and then the image is set when the paper is pressed between heated fuser rollers. The remaining toner is then scraped off the drum into a used toner chamber, and the drum is recharged for the next copy. This description is somewhat oversimplified, but should give you the general idea.

The toners used for laser cartridges are specially designed for the Canon fuser rollers, and contain certain polymers as releasing agents. These releasing agents prevent the toner from sticking to the fuser rollers or photoconductor and causing streaking or possible damage. Some toners use polymers that are not compatible with the Canon fuser rollers, so refillers have to be very selective of their toner sources.

Paper Caution!

It seems that a rumor was published in *PC Week* (April 26, 1988. "Rumor Central") to the effect that Canon was intentionally putting "abrasive particles mixed in with the toner" in its cartridges, to assure a shortened life that would not support refills. This has been vehemently denied by H. Murase, senior vice president of Canon's Reprographic Products Group. He also writes, in part, "Canon does not categorically oppose the refilling of laser printer cartridges, but does object to the unfair practices of certain refillers who misrepresent the life and capabilities of refilled cartridges or otherwise mislead customers."

But there's more to the story. Jeff says, "Why do some drums come out real shiny and new when we get them to refill, and some come out looking like someone took Brillo pads to them?"

Through his testing, and discussions with his customers, Jeff has come to the conclusion that the paper weight and texture have a direct effect on the wear and tear of the drum. "The heavier the paper and the more course the texture," Jeff adds, "the more the drum surface is worn down. If you use light weight Xerox paper—up to 20#—and it's smooth and clear, you'll find you can get a longer life and more refills from your cartridge. You can go to a heavier pound paper, but don't make it rough in texture."

He also warns about envelopes with sharp corners that can scratch the drum if not fed properly.

When To Refill

I asked Jeff how a user could tell when it was time to replace or refill a cartridge. He says you shouldn't be concerned with an indicator in the red, or a readout that says "TONER LOW." These are all based on revolutions of the drum, not how much toner is remaining. You might have enough toner left for hundreds of perfect copies. "Use it until it's empty!", he says. "When you see white streaking, that's when you're empty. It won't damage your cartridge and it won't damage your machine."

Refilling Process

Jeff explained how Laser Refill processes used cartridges. The refilling process involves many steps. It starts with complete disassembly of the cartridge, using the proper tools. The various internal parts are cleaned and inspected visually. The main chamber is filled (30% to 50% more than the factory) with high quality toner. Black is standard, but brown or blue toner is available for the EP and EPS cartridges.

The counter is reset, the wiper blade is adjusted (or changed) to assure clean printing, a new pull-tab plastic sealing strip is installed, and the cartridge is reassembled. For PC and EPS cartridges, a test copy is returned to the user with the cartridge to verify proper operation.

Fuser Wand

The fuser wand, which keeps the machine's hot fuser roller clean, should be replaced with each cartridge change. If you send the used wand with your cartridge, Laser Refill takes out the dirty felt, puts in a clean felt strip, and packages it in a zip-lock plastic bag together with a double-ended cotton swab to clean your machine's corona wire. That's a very nice no-extra-charge service.

If you have thrown away your fuser wands, you can get a replacement from Laser Refill: $5 for PC or EP machines, $7.50 for EPS machines.

How Many Times?

I asked Jeff Graber, based on his experience, how many times a cartridge could be refilled and still be usable. He

continued on page 590

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Run 8 Bit Software On The Atari ST! The ST XFormer Story

by Frank & Sally Nagy

Remember all those neat 8 bit games that you waved good-bye when you upgraded? How would you like to be able to play some of them on the ST? You can with an 8 bit emulator developed by Darek Mihocka.

With 2 years and plenty of hard development work behind him, Mihocka keeps updating his 6502 microprocessor, 8 bit emulator. The most recent copy we've seen is ST XFormer II 2.1.

His new programs are getting better and better. His August released ST Junior for the 520 is worth trying out, where what came out the month before was merely a disappointing teaser!

Sally who had been waiting for the XFormer II was delighted to see it available, but not very happy that it required 1 meg.

Others must have thought the same thing, because Darek was prevailed upon to create ST XFormer II Jr. for half meg machine users.

Recent development of the XFer program now gives both 520 and 1040 users the option to create *.SD files. Before, 520 users had to buddy up with a 1040 user to make files or rely on files sent out by Darek.

But Junior does run 8 bit software! Sure it runs stripped naked of the usual ST clothing of GEM desktop, RAMdisks and accessories. XL and Fastchip ROMs are gone. Monochrome support is eliminated, leaving only single drive color. But it works!

Can XFormer II Run The Classics?

"Yes, some classics," said Mihocka.

Darek told Sally during a phone interview that Broderbund's "Choplifter" and Electronic Arts' "Hard Hat Mack" work. Darek's favorite, Broderbund's Loderunner runs at almost full speed and is very playable after he applied a 2 byte patch.

You can forget running the old cart favorites, i.e. Missile Command and Pac Man. With Pac Man Jr., it starts to run, but does so without ghosts. When pinned down about "Mule," he confessed he only got as far as the title screen.

Most of these "classic games" are in a cartridge format and the normal ST has no compatable port to allow direct connection.

To use cartridge games on the ST requires first cracking copy protections and putting the game on disk. While making a copy of your own software for personal use is legal, the action is suspect because this is also how pirate versions have been made.

But, he admitted, purchased software lacking copy protection can be transferred via Diskcomm to the ST.

Graphics oriented games present their own difficulties. They make heavy use of the ANTIC, POKEY, and GTIA chips, and little use of the 6502. Darek's software goes extra lengths to compensate, but cannot emulate the ANTIC and other chips perfectly.

His main "bug" now is trying to emulate display list interrupts which many programs use. "However, there are a number of tricks that can jumpstart games by patching a few bytes of code here and there," said Mihocka.

Mihocka hopes people will post suggestions to patch up the various programs as they use them and discover how to fix any problems they find.

Darek Mihocka invites Atari 8 bit programmers to try their software on the XFormer. Those interested in allowing ST users to run their software should send him a copy with its listing. He will try to fix any problems that show up in later updates.

He also asks users to send him 3½ inch disks containing 8 bit files that they

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Is Laser Toner

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said that many of the parts in the cartridge have different life expectancies, but that most are easily replaced. The shortest-life component is the photoconductor drum, and there are currently no replacement photoconductor drums. Some independent manufacturers (not Canon!) are working on methods of resurfacing used drums, but they are not yet available.

For the PC or EP cartridges, you can expect to be able to refill them an average of four to six times. For the EPS cartridge, used in the Series II printers (Canon SX Engine), because the photoconductor is much smaller and makes more turns per copy, only about one or two refills are likely before the photoconductor shows wear—but sometimes three refills are possible.

If some of the other parts need replacement, Laser Refill has plenty of parts on hand from cartridges that ended their useful life because of a worn out photoconductor. These parts, such as a stripped nylon gear, or worn-out counter, or warped wiper blade, for example, are replaced at no charge. This is, as Jeff says, "transparent to the user."

I asked Jeff what happens if a cartridge is defective on receipt. "Some people send me a cartridge that produces a scratch or a streak, and expect back a finished product that works perfectly. We test them before disassembly, to be sure we can deliver a good refilled cartridge." If the pretest fails, the customer has the alternative of their money back, purchase of a new cartridge, or cancellation of the order if it's a Purchase Order.

What If I Don't Have A Used Cartridge?

Laser Refill prefers to refill your own used cartridge, rather than supplying a used one with unknown history. You know how well yours performed previously, and perhaps how many times it has been refilled.

If you have a cartridge that's not performing well, include a sample of a bad copy and Laser Refill will give particular attention to correcting the fault. There is no charge for replacing anything except the photoconductor drum, which can't be replaced at the present time.

Of course, if you don't have one to refill, you'll have to purchase a new cartridge. Jeff pointed out to me that Canon manufactures all the PC copier and Series I and II laser cartridges, regardless of the name on the box. He recommends that if you need to buy a new cartridge, buy the least expensive one you can find, since they are identical!

What Does It Cost?

Most cartridge refillers charge different prices, usually depending on the model of cartridge being refilled. Laser Refill has a flat price of $39 (plus sales tax for California residents) regardless of the type of cartridge. They refill cartridges from all laser printers that use the Canon Engines, and all models of Canon PC copiers and Canon FAX machines.

There is one exception to the flat price. If you want brown or blue toner for the EP or EPS cartridges, that's an extra $10. Only black is available for the other cartridges.

The customer pays shipping to send the cartridge, but Laser Refill pays return shipping. In some Los Angeles areas, Laser Refill will pick up and deliver orders of significant size. Call Laser Refill for details.

I asked Jeff what he sends to customers who call. He gave me eight sheets with good information, including a simple order form.

Summary

For one-third to one-half the cost of a new toner cartridge, you can get a quality refill that will give you 30%-50% more copies. Don't even think about refilling your own toner cartridge. Although I've written specifically about Laser Refill, they are not the only ones that do this work. But be careful! Ask a few questions before sending in your used cartridge.

Do they drill holes or disassemble? How long have they been doing this work? Does the refilled cartridge have a sealing strip installed? Does the price include return shipping?

Check the guarantee. For example, Laser Refill's warranty is as follows: "If a problem is encountered simply call the Main Office, and a representative will help. If the cartridge does not operate properly, Laser Refill Company will replace it or refund your money." I asked Jeff about a time limit. He said, "There is none. It may be months after a customer receives a refill from us before he gets to use it. We trust our customers." ●

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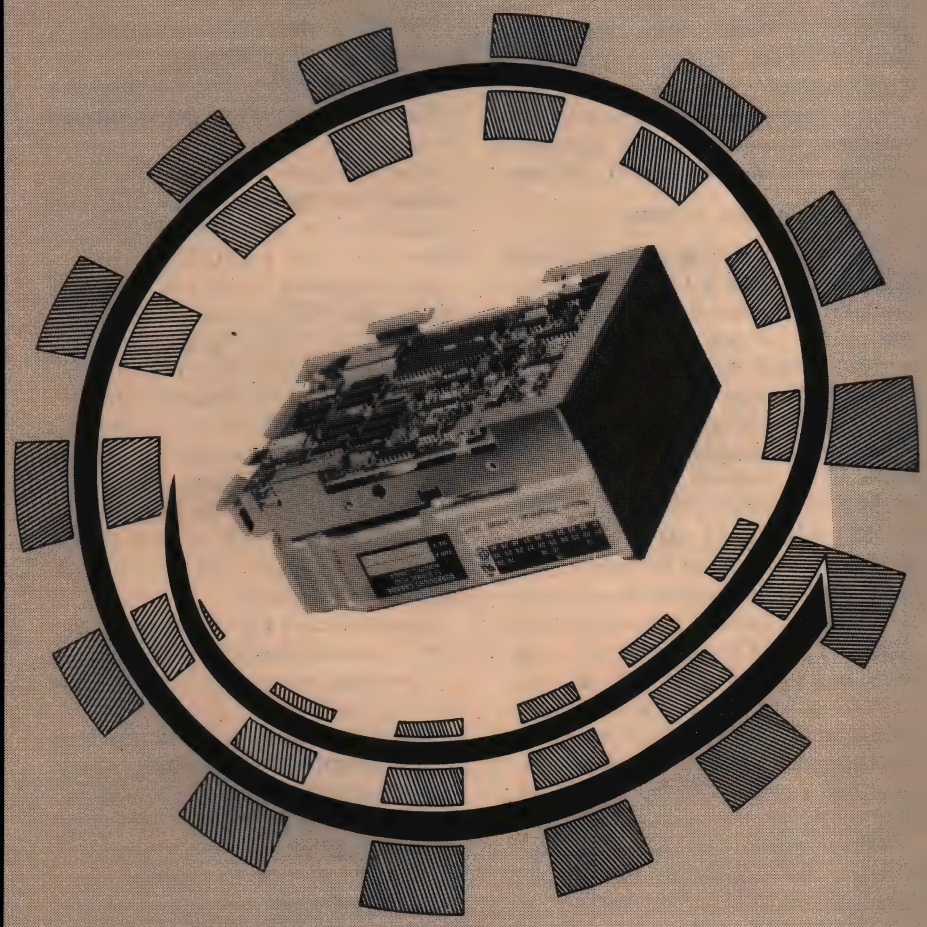

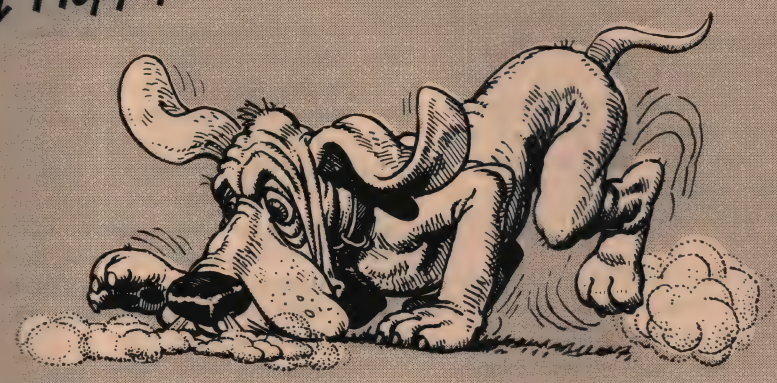

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Run 8 Bit
continued from page 590

have ported over to the ST. In exchange, he will return the disk with 800K of 8 bit software sent in from other users.

Files that work will go on his compatibility list. Those that don't will be examined to see if they can be altered to run.

Mihocka will also continue to make program packs of *.SD files available. Those who register with him will receive a disk full (800K) of 8 bit software already ported to *.SD files.

We tested the ST XFormer on both the 1040 and 520 and found it to work well enough for some programs. "Maze wars" runs at what seems a challenging enough speed for about three battles of Wizard against Zombie before crashing.

Some will be pleased to see the well-known CES demo robot strut his mechanical stuff on the ST.

But other programs weren't nearly so good. One ran so slowly we gave up before getting out of its title screens. LiveWire's graphics looked a little weird and skipped some of its levels.

Some programs didn't run at all. You'll just have to hope that the ones you love happen to be the ones that operate up to snuff.

Darek spends a lot of time making software fixes or improvements in his product.

He now plans for version III to take a different approach answering the same needs. The ST XFormer III will compile programs into native 68000 code first before executing them. Mihocka predicts most Atari 800 programs will run at least 2 to 3 times their normal speed.

We're sure users will be happy if the software runs at normal speeds, especially if other graphic problems can be fixed.

Even with the present limitations of his work, it is clear he has come a long way to getting a working product.

What started out as a simple challenge to create something useful became more than just a long term project to Mihocka. He has hung in there, surviving verbal blasting by Atari for computer piracy, to end up cooly wangling an agreement which allows him to produce his rough, but usable product as shareware.

When the ST first came out, Darek, a former Atari 400 user, delayed a year before buying one. Like many who had invested in a lot of software for systems they already had, he was waiting for someone to make something that would allow users to run 8 bit software on the ST. One day he decided to stop waiting and write such a program himself.

He and Ignac Kolenko became engaged in the tremendous task of writing a multi-processor emulator. Later, seeing they had taken on more than they could practically chew, they focused their vision to produce a more limited 6502 emulator, releasing the first demo in January 1987.

Programming with Megamax C, Darek's first version of the 6502 interpreter ran at 7% of normal speed. A month later he got it "sort of working" at 30%. Because he was having difficulties reading and doctoring hardware locations in the system he was using, Darek decided going after an Apple II emulator would be healthier. Soon he was busily porting files to test his new hybrid.

Here, Darek started to run into a few "worms." Apple argued that his activities constituted illegal infringements. He started chopping up his Apple routines, managed to fork up a Translator, mixed in Atari BASIC. It was out of this that a very primitive Atari emulator emerged from the Mihocka kitchen.

(Apple and Commodore have continued to balk all attempts of the author to license emulation of their lines. Version 2.1 provides limited Apple support for those capable of porting the copyright protected Apple ROMs. Darek doesn't plan to do much more on Commodore emulation unless people show more interest.)

After innocently uploading his Atari emulator to the Atari BBS, he was sternly rebuked. Atari considered his work an act of piracy.

Mihocka's sheer tenacity in the battle of wills that ensued with Atari officials finally bore fruit. With certain limitations he was allowed to release his emulator as Shareware. Part of the deal was publishing his code.

In September 1987, ST LOG printed the first half of an article by Darek, describing his emulator. Part 2 was published, in April 1988. Look for his newest article on the XFormer II. Atari must be happy with his good faith gestures, however, as his recent contacts have been far more cordial and co-operative.

So, Darek's emulator is now legally and easily available via BBS or mail to anyone who wants to try it for free.

Updates, Updates

There are substantial differences even between 2.0 and 2.1 versions of the emulator. More memory efficient than version 2.0, version 2.1 fixes 3 bombs in color, black stripes in mono, and crashes to the menu bar. Several new features are added including better player missile graphics. 800 XL RAM under ROM memory emulation, and Turbo BASIC XL (a PD BASIC, similar to OSS's BASIC XL) can be run. Double density disk drive support can be had if all other accessories are removed.

Versions 2.0 and 2.1 are not just an update of Darek's earlier efforts, these brand new programs eliminate the problem of horizontal blank interrupts. XFormer II drops earlier text based keyboard entry. The redesigned replacement has a new GEM handled interface taking over most functions.

800K of memory is used, so memory intensive desk accessories are out, but it can load with either Deskcart or Control Panel still installed.

Tested on 1040 ROM, Mega ROM, and the "new" ROM machines, this version emulator supports DOS and non-DOS, Player Missile Graphics, allowing emulation of most interrupts and hardware registers.

Darek has successfully run DOS 2.0, DOS 2.5, DOS 4.0, Sparta DOS 1.1 and MYDOS 4.1. He claims that all other DOS pre-configured for an 810 drive should work also.

Use PC Ditto's external 5¼" drive as drive B. Double density disks formatted on Indus GT And Atari 1050 with US Doubler can be read and easily transferred with the new XFer program.

Now both 520 and 1040 users can create *.SD emulator files. This is a nice addition for half meg users. Before they could not make their own files, but had to rely on other sources.

Not all of the functions were fully operational when Mihocka first uploaded it to BBSs, but he promises registered owners will get a full featured version.

The XFormer program has been released nationwide on Atari BBSs and information services like Bix, CompuServe, DELPHI and GEnie.

The following is a list of XFormer related files: STXF21.ARC which contains STXF21.PRG and text file (for 1 meg users), STXFXP.ARC the ST XFormer file XFER Program for both versions, STXPP2.ARC—a program pack which contains Turbo BASIC and DOS 2.0D, for 520ST users, STXFJR.ARC—ST XFormer Junior, DISKCOMM.COM—a disk (un)compressor and TEMPELMON.ARC for modifying these programs.

Anyone can try Darek's programs for free. Those satisfied may register to get an opreations manual, and further software support.

Those who have enjoyed previous releases ought to think seriously about registering with this shareware author, if only to keep up with new developments. Another update release is scheduled for sometime in October.

Those preferring to register with him by letter can save the costs of downloading these huge files (200K ARC) from a pay BBS.

A laser printed, illustrated manual accompanies every purchased XFormer

continued on page 593

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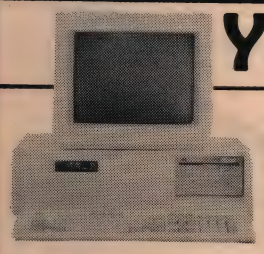

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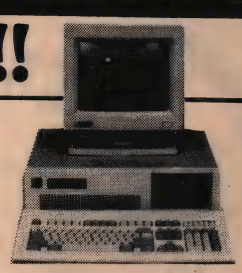

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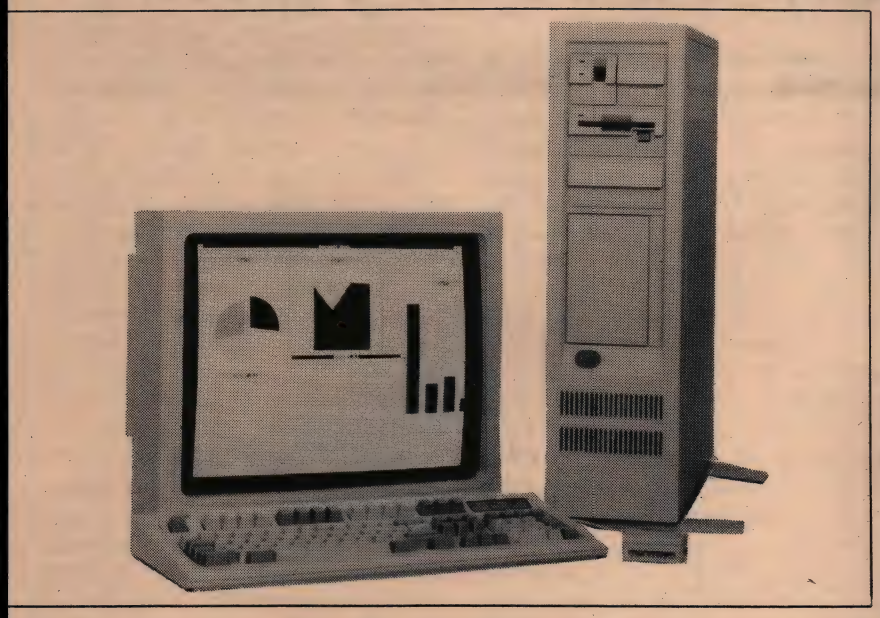

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It also includes Microsoft Windows 2.0 compatibility for the first time on a large screen monitor, giving Microsoft EXCEL users a first look at that application running the way it was designed, with multiple spreadsheets and graphics on the screen at one time.

The Viking 1 for the IBM PS/2 is available immediately. The suggested retail price is $2,395.

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ATI Offers Spooler/Collator For Easier Printing

A Spooler/Collator that allows laser printers to print multiple collated copies of multi-page documents at a remote site is now available from Advanced Technologies International (ATI).

Using the new product, one copy of a multi-page document can be sent to the printer to produce multiple collated copies of output. The Spooler/Collator also allows the printer to adjust to unique font selections, logo and letterhead printing, and signature duplication. The device is able to collate up to 99 copies of a 99 page document, and is compatible with both the DW-2 and DW-3 families of laser printers from ATI.

The product comes in the SP-1 version for 512 Kbytes of RAM, and the SP-2 for 1 Mbyte of RAM. The spooler resides inside the printer and is configurable to work with most host systems. The spooler acts as a large buffer, receiving sequential data from the host system either page by page or document by document. It is also used as a collator and string definition and substitution device.

Both the SP-1 and SP-2 are available now. The SP-1 sells for $1195 while the SP-2 costs $1495.

ATI, founded in 1984, is a U.S. headquartered member of the Rental Research Group, a large IBM VAR based in the United Kingdom. ATI focuses on non-impact printing solutions for a wide variety of business needs. The company functions as an integrator and distributor of printing systems, and as a systems consultant, providing printing solutions that meet the text and graphics requirements of its customers.

For additional information contact Advanced Technologies International, Inc., 355 Sinclair-Frontage Road, Milpitas, CA 95035; (408) 942-1780. ●

Run 8 Bit

continued from page 592

II. The manual is a step by step guide through all of XFormer's features. It contains tips on converting 8 bit software to the ST. An up to the minute list of compatible software is also included with the latest updated version of XFormer. (The guide tips and listing amount to an additional estimated $7.50 in value.)

Dareks asks for a $20.00 registration fee.

If the download-to-registration ratio Mihocka himself has given is any indication of others' satisfaction, we have to sadly report that only one out of thirty who have tried it have bothered to register.

Granted, many people love to use shareware without paying anything, but with all the incentives Darek is offering to registrants, he had hoped for a better response.

In future updates, Darek intends to add display list interrupt support and XL/XE bank select memory emulation. He expects his XFormer III might be ready by the end of the year. Its predicted increase of speed should make this version even more desirable.

Darek's voice telephone number is (519) 747-0386. (Please, no modems!) He welcomes suggestions and says to feel free to call him at any hour with any questions or suggestions. Darek can be reached on Bix, DELPHI, GEnie as DAREKM and CompuServe as #73657,2714. Or write him at: Darek Mihocka, 310-d Bluevale St. N., Waterloo, Ontario N2J 4G3, Canada.

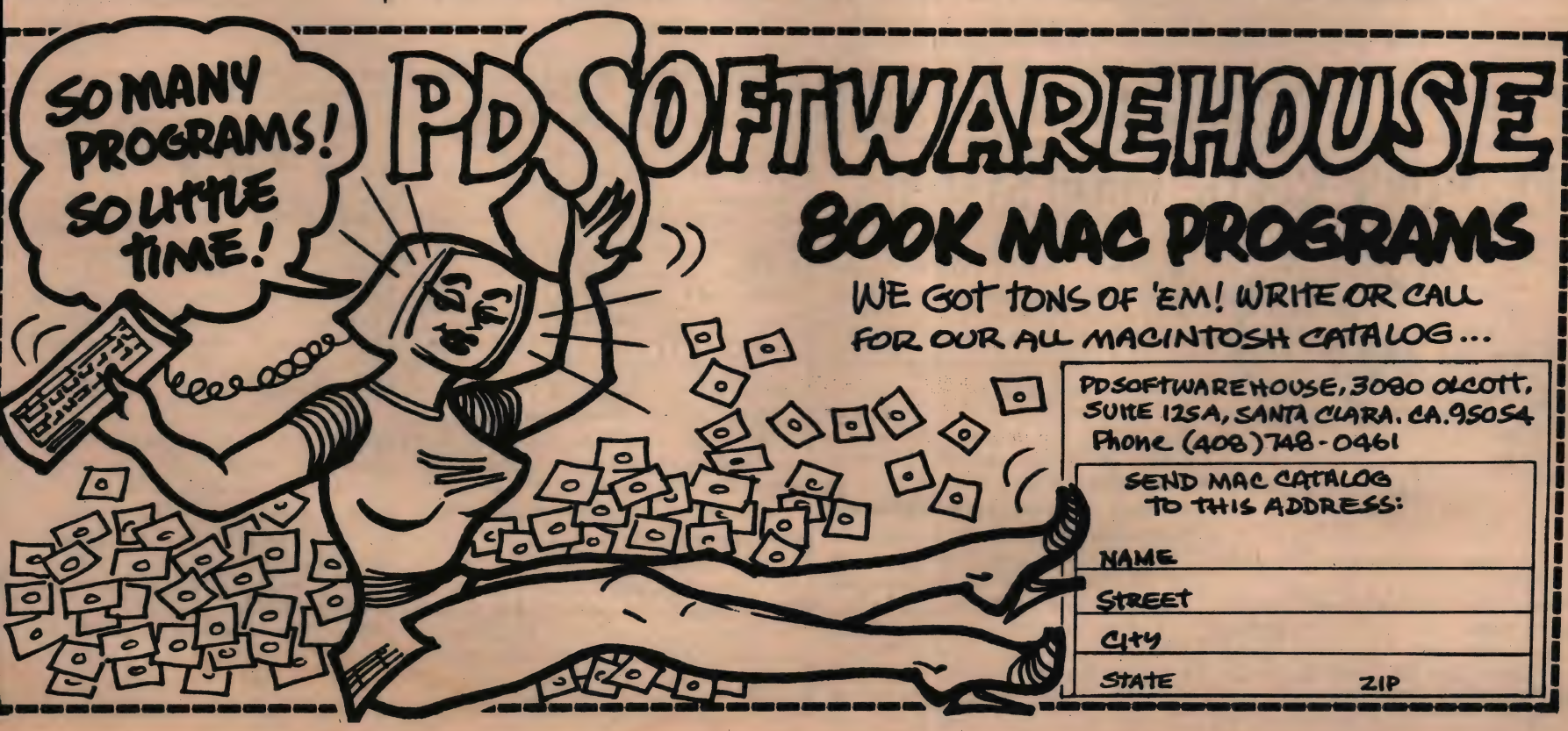
In Summary

Give Darek Mihocka a gold star for tenacity and another for improvement. He has had to get around several technical roadblocks like the problems that arise where Atari 800 similar features do not exist on the ST, such as 4 voices, 4 joysticks or paddles. And he has run the guantlet with various companies sniping at him for his efforts.

He is a lot closer to his goal of fully supportive emulation, but his quest continues. We have to say his emulators still only provide spotty support of 8 bit files on the ST.

The performance of ST XFormer II presents a lick and a promise. If Mihocka has given us an accurate taste of what we can hope to see him bring us in the future, we can expect that someday soon 8 bit owners will be able to seriously consider Darek's XFormer as a further incentive to a system upgrade.

As for the Nagy's, we plan to wait and see just what he delivers in his version III before discarding our old 8 bit computer for emulation of the ST. ●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DataPerfect: User-Friendly Database System?

by Stephen B. Gray

The WordPerfect word processor, with a user-friendliness that contributes in a big way to its success as the most popular WP system, now has a companion database system. DataPerfect, on the other hand, isn't all that user-friendly; you have to learn a great deal before you can use it profitably.

As the package cover puts it, DataPerfect offers "menu-driven simplicity for those new to database definition, and an extensive range of features for experienced users." True, but the documentation leaves something to be desired.

DataPerfect is a powerful DBMS with a few too many holes in its paper garments. Once those holes are filled in—perhaps even despite them—it could also become a best-seller.

The attractive package contains a 176-page User Manual, 368-page "Definer Manual," four-page user and definer quick-reference guides, keyboard template, and both 5¼-inch and 3½-inch diskettes.

DataPerfect is compatible with WordPerfect, offers on-line help screens at several levels (which can be augmented by the user for specific applications), and permits creating an index with one or more fields in a database (you can also define several indexes per database). As for field formats, you can create alphameric (fixed or variable length), uppercase, date, floating-decimal, time and numeric-field formats.

Each database file has its own "panel" or box on the screen, so you can easily distinguish one file from another. DataPerfect also uses the panel to display records.

To get into DataPerfect, once you've set it up on your hard disk or in your diskette drives, type "dp" and press <ENTER>. A list of all databases in the current directory is displayed; move the cursor to the one you want, and press <ENTER> again.

Now you see a list of the database "panels" each of which is a display of a record in the database file you've chosen. As the User Manual puts it, "Records are viewed one at a time in the panel, and the panels can be indexed, related, and interrelated in a variety of ways."

You create these panels, up to 80 of them per file, each representing a different type of record. If you want to show the relation of one record to another, you can display more than one panel on the sceen at one time.

Move the cursor to the listing of the panel you want to see, press <ENTER> a third time, and the panel comes up on the screen. With just three taps on the <ENTER> key, you've gotten to the core of the system, which is a DataPerfect record.

Each panel contains fields, and labels for these fields. The left/right arrow keys that move the cursor within a field do the same in WordPerfect, which is a great help to anyone using both.

The DataPerfect keyboard template will look familiar if you've used the WordPerfect template, because some of the commands use the same function keys: <F1> for cancel, <F2> for search, <F3> for help, <F7> for exit, <F10> for save, <CTRL><F1> for shell, <CTRL><F3> for screen, <CTRL><F4> for move, <ALT><F3> for block, etc. How nice to be able to block and move text without having to learn a new set of commands!

Let's look at a practical application for DataPerfect. A large mainframe installation, with thousands of programs, usually needs a program dictionary, which describes briefly what each program does, gives its number, tells who wrote it, and what system it's part of.

You can create a database for this program dictionary in DataPerfect, which will allow you to look up the description of any program by its number, programmer or system.

You design the database using a menu-driven definition scheme, and set up fields for program number, system, programmer, and definition. You can also set background and foreground colors, to help read the screen.

Once you've entered all the data, either from scratch or by importing it from an existing program dictionaries not so hard to use, once you understand how, which is not all that easy to learn from the user guide.

If you want to locate a program definition, just enter the program number in the number field and press the up-arrow key, which invokes the lookup feature. This is the heart of DataPerfect, a powerful command that displays, at the top of the screen, six out of the array of program numbers, each followed by the programmer's name and the system to which the program belongs. The cursor is on the program number you selected, and at the bottom of the screen the program number, system and programmer's name are repeated, followed by the description.

Now comes the fun. As you move the cursor up or down with the arrow keys, the data in the lower panel changes, showing the data relating to the program number under the cursor. You can print out a definition at any time, or just browse through the programs.

Suppose you want to look at all the programs in a particular system. Just hit the tab key until the lower-panel cursor is on the system name and press the up-arrow key; the upper panel will display a list of programs in this system, followed by the program's number and programmer. You can print a report showing the numbers of all the programs in the system, along with the programmer of each.

To look at all the programs written by a particular person, move the cursor to his or her name, do a lookup with the up-arrow key, and you get a series of lines, each containing the programmer's name, the program's system and number.

The search feature lets you select records for a report, or records to be removed. You can specify ranges, templates (with wildcard characters), and/or formulas in a search string, and then perform the search on any number of fields in a panel. You can also use conditional formulas with And and Or.

The User Manual is divided into three parts. After a several dozen pages on "Getting Started," you get a fine "User Tutorial," which contains a series of graduated lessons to be used with the DataPerfect Applications floppy.

The nine hands-on lessons cover Fundamentals, Entering Data, Search, Reports, Doorways, Doors and Totals, Export/Import, Using Shell, and Screen Options. Doorways let you move from one panel to related panels, and move data from one panel to another.

The shell program does not come with DataPerfect, but with WordPerfect. Using the shell's "clipboard" buffer, you can move database information into other DataPerfect records or outside programs. A common use of this feature is to merge a WordPerfect letter with addresses residing in DataPerfect.

The third part of the User Manual is a Reference guide to 32 features of DataPerfect, not just a guide to individual commands. You get fast how-to lookups that are very rare in reference guides, most of which require searching through several separate sections on individual commands to find out how to perform a task that uses them in sequence.

If you're already familiar with a database or two, you should have little or no trouble understanding DataPerfect from the User Manual. But if you've never used a database, you'll find the User Manual too skimpy in too many places, because the emphasis is on what to do, with little or no explanation why.

The lesson on Doorways says that panels are linked together with doorways and doors, and adds that a doorway is attached directly to a regular field (defined the same as any other field), while a door is "free-standing," a distinction that may not be clear. Once you understand doors, though, you may find them one of the best things about DataPerfect, letting you move to and from related data with ease.

Most of the tutorial examples in the User Manual give no indication of the power of DataPerfect, and make it seem suitable mainly for trivial applications. Of course, simple applications are needed to demonstrate to beginners how this database system works. So you get one on state names and abbreviations and another on addresses, both explained quite adequately. But then the manual gets into a petty-cash database, which is more elaborate, and which begins to give some idea of what DataPerfect can do, but you're left high and dry with only six short pages of explanation.

The chapter on Export/Import tells you how to perform these functions, but there's a great deal of explanation missing. DataPerfect uses "clipboards," which the initiated will understand to be cut/copy buffers, but which may mystify beginners, who won't find the word in the Definer Manual index.

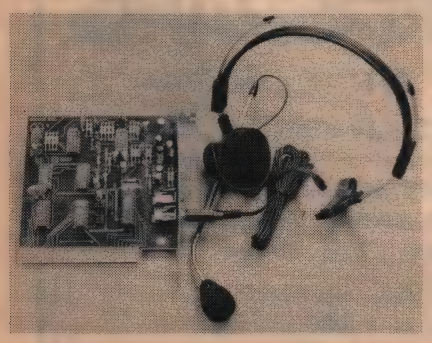
However, don't let these comments on the User Guide hold you back from taking a look at DataPerfect, which has a great deal to recommend it. It would be even easier to use if it were programmable, but it's not; you have to use the panel system that's provided.

DataPerfect carries a suggested list price of $595 at dealers, and runs on the IBM PC, XT, AT, Personal System/2 computers, and close compatibles. DOS versions 2.1 or higher and 192 Kbytes of memory are required. DOS 3.0 or higher is required for DataPerfect to run on a network system. DataPerfect is available at computer dealers. WordPerfect Corp. is at 288 West Center St., Orem, UT 84057 84057; telephone (801) 225-5000.

DataPerfect is a very useful DBMS that handle many applications in a deceptively simple fashion, once you get the hang of it, and learn to be careful which keys you hit. It's not idiot-proof; a beginner can easily delete a record without realizing it. DataPerfect should be especially interesting to users of WordPerfect.

The User Manual and Definer Manual should both have been expanded by the time you read this, according to the manufacturer. ●

PC Voice Recognition System



Add voice commands to IBM PCs and compatibles with this modestly priced ($130) hardware and software system. Voice Master Key is a RAM resident utility that allows up to 256 voiced inputs to replace dozens of keystroke or mouse click combinations with fast and accurate results. The speaker-dependent, isolated word recognizer works with most existing programs running under MSDOS. System is suited for CAD, desktop publishing, word processing, or other programs where voiced input serves to increase user productivity. Major feature of Voice Master Key is the ease in which voice commands and their associated keyboard macros are assigned. All functions are accessed using pop-up windows and menus. Entire program occupies less than 64K of memory. System consists of half size card, headset, software and complete documentation.

For more information contact: Covox, Inc., 675 Conger Street, Eugene, Oregon 97402. Tel: 503-342-1271; FAX 503-342-1283. ●

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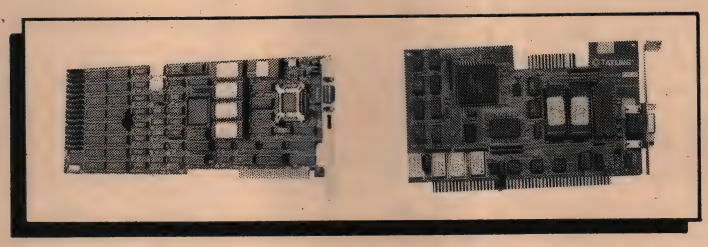

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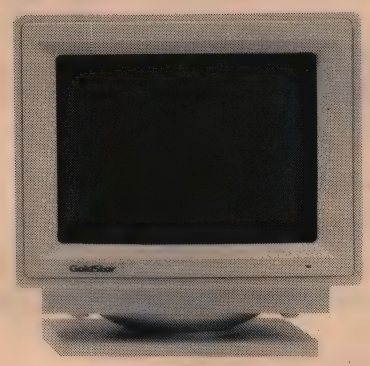

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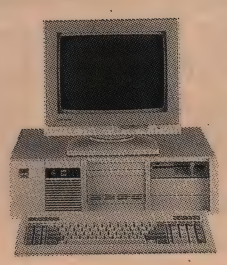

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IDR To Market New Video Imaging System Board

IDR Inc., a Reuter Company, will begin stand-alone sales of its new high-performance video imaging board which turns a PC-AT compatible computer into an integrated full-color image processing system.

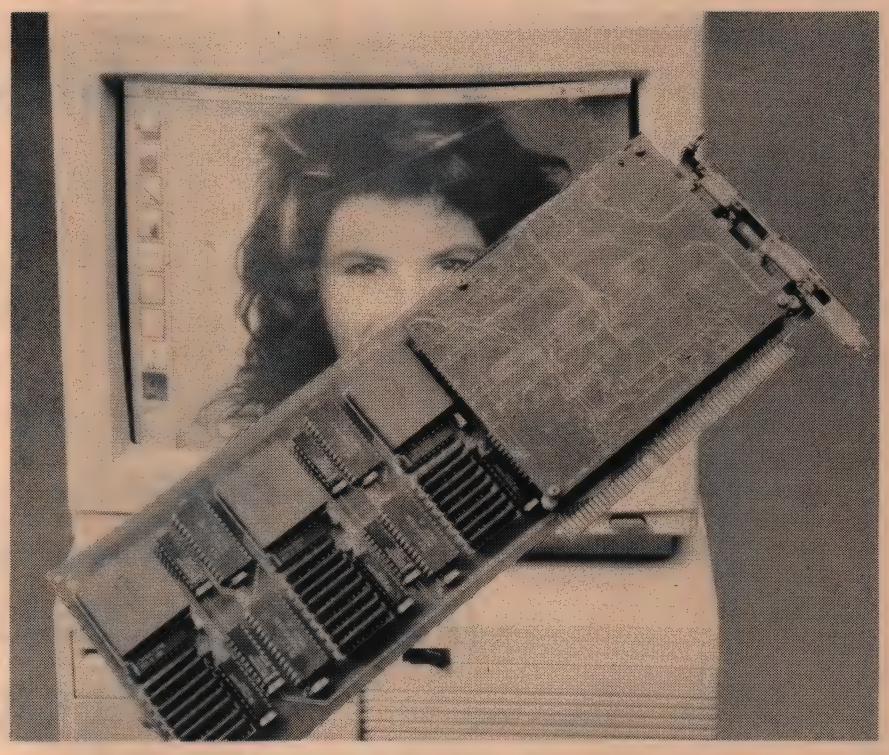
The IDR Capture, Merge and Display (CMD) Board can display a full-motion video image—together with a virtually unlimited number of windows containing captured still video images, graphics and text—on an RGB analog television monitor, in more than 16 million colors.

The CMD Board, an integral part of IDR's recently introduced Imaging System, enables original equipment manufacturers (OEM) and value added resellers (VAR) to configure their own imaging systems and design their own end-user applications.

The CMD Board consists of three Intel 82786 graphics co-processor chips, each supporting one megabyte of random access memory; an on-board time base correction circuit; and high speed analog-to-digital and digital-to-analog converters. The three (3) megabytes of on-board memory allows three full screen digitized images—each with a resolution of 640x480—to be stored simultaneously at 24 bits of colors per pixel.

Images from any video source (i.e. laser disks, still frame recorders, video cassette recorders, video cameras and live TV signals) can be fed into the CMD Board, where they are digitized for processing in real-time, then reconverted to analog form and displayed on a screen. During this process, users can "freeze" a frame of the digitized video at random and store it in the memory of the 82786 graphics co-processors. There, images can be enhanced, colors and size altered and graphic overlays created. The captured and digitized video frames can then be output to a hardcopy device such as a high-quality laser printer or organized into a digital storage media library for future use.

IDR's CMD Board allows the user to overlay an image from memory on the screen while a "live" video image is being displayed in the background. This overlaid image can be a previously captured frame or an EGA compatible window of text or graphics from the workstation. The image can be moved vertically and horizontally about the screen and enlarged up to 64 times. Multiple images also can be overlaid on top of the live video.



A library of software tools is included as a standard with the CMD Board. This facilitates development of market specific applications. The IDR imaging board is available for immediate shipment.

For further sales and marketing information, contact Bonnie Malsich, IDR Inc. 370 Vanderbilt Motor Parkway, Hauppauge, NY 11788; (516)434-1900. ●

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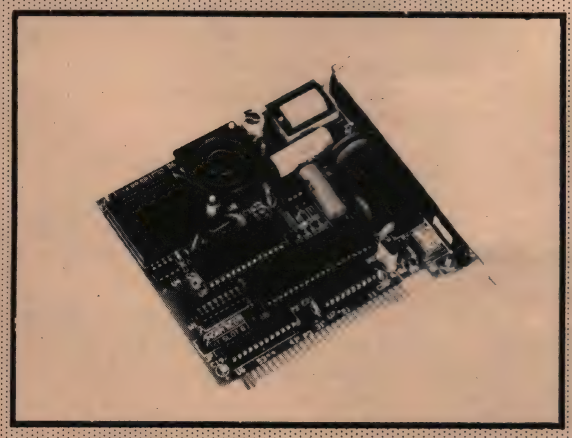

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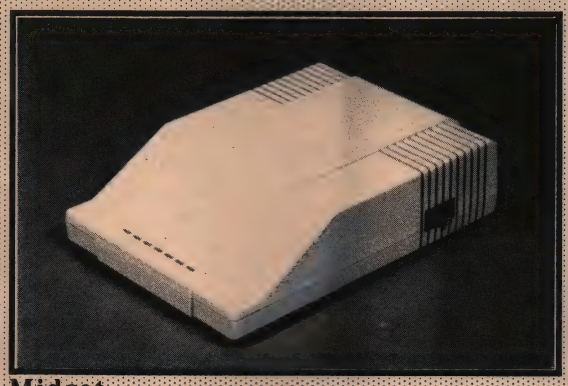

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Tandy Announces Cash Prizes For 100 Students, Teachers

Left to right, Dr. William E. Tucker, Chancellor of TCU, John V. Roach, Chairman of Tandy Corporation, and Michelle Easton, Acting Deputy Undersecretary of Intergovernmental and Interagency Affairs, the U.S. Department of Education, share the limelight at the unveiling of what probably will be a million dollar Tandy Technology Scholar Program.

by Jim Horn

Computer Shopper's readers who are either high school students or are teachers of math or science or computer science stand a good chance of having one to two thousand five hundred extra dollars toward their expenses in the fall of '89. Even better are the chances of getting a nationally promoted award for academic excellence, the kind of paper useful to students seeking entrance to top ranked schools and even scholarships. Such an award, even without the cash, would also be nice for a teacher's wall at home, and certainly would not hurt on the curriculum vita when gunning for that special teaching assignment.

Good Winning Odds For Early Birds

At the announcement of the Tandy Technology Scholars Program here at the National Press Club, on 7 September Chairman of the Board and CEO of Tandy, John V. Roach gave a businesslike appraisal when asked the probabilities, saying he felt the chances were "good" for those getting into this new award program the first year, which Tandy hopes to expand based on results. Indeed, hints were heavy that such schoolboy admonitions as "the early bird gets the worm" were appropriate for principals, teachers, students, and parents. TCU Chancellor William E. Tucker was even more direct. He as a parent would "be concerned" if he learned that the principal in the high school in which his children were enrolled was not filling out the appropriate forms to give the schools children and teachers a shot at the award for excellence.

Careful Selection

Texas Christian University will develop the criteria for the selection of students, teachers and schools. Students will receive the award during their senior year according to Roach. Awards will be for the current school year, with forms and nomination rules being mailed to every high school in America.

Selection procedures will be established by late fall, with secondary schools beginning to receive information about the program shortly thereafter. Participation forms will be mailed after the first of the year. While Tandy Corporation will provide some logistic support to the Tandy Technology Scholars Program, the company will not participate in the three selection processes. Schools must be judged to have a "meaningful program" in math and science and availability of computer science. Both Tandy and TCU speakers left the impression that entrance criteria would be fairly liberal, at least in the first year, with each American high school offered an opportunity to seek qualification. Roach stressed that this program was not a computer equipment program. While people receiving the awards can be computer science instructors, there is no tie-in with Tandy products. Therefore, if you are an excellent teacher of science, math, or computer science at the secondary school level, or a student who excels, this is your shot, regardless of the type of machine you have at home or at school. If you are a school administrator, you owe it to your students and teachers to give them an opportunity, leaders of the event said.

One of the goals of the program is to help turn the attention of "gifted students and gifted teachers toward science, mathematics, and computer science" Tucker noted. The Tandy initiative, Roach explained, was taken against the backdrop of a practically non existent domestic consumer electronics industry and steadily dropping student achievement levels as measured by standardized testing. Even our best students, when measured against the best in eleven other nations scored last. Indeed, our best students are beat by even the average Japanese student of 17.

While declining to set a precise amount on the Tandy commitment, Roach figured that the Tandy expenditure the first year would be double the $350,000 in prize money (called stipends at the news conference). He broadly hinted that the dollar expenditure as well as the number of students receiving money prizes may be expended in future years. This "is not a Top 100" Roach insisted, because higher numbers in future years could make that title meaningless.

A Texas Success Goes On The Road

Fort Worth based Tandy was inspired to start their education show by the success of an effort instituted by the company as a corporate good neighbor program. The national program differs somewhat from the Texas program because of the need to "reach the breadth of the country in which we do business in." Tandy is indeed "in every burg and village of any size in the country," Roach noted.

The Tandy Technology Scholars program will be offered to the nation's 22,000 schools. Tandy promises to do as much as it can to encourage school administrators to apply for recognition and to nominate teachers and students for the stipends and certificates of award. All nominees will also receive a certificate of participation, an honor in itself.

As each distinguished speaker at the Tandy presentation staked out a position, I thought "they are talking about the bright, technically aware, aggressive students and teachers who read *Computer Shopper*."

U.S. Department Of Education Lauds Tandy

The feds were there, of course. Representing the Department of Education and Secretary Bennett was Michelle Easton, the Acting Deputy Undersecretary for Intergovernmental and Interagency Affairs. She outlined multiple examples of business-education partnership, supporting the general thrust of the Tandy program. Undersecretary Easton dwelled on the serious problems facing America in terms of lowered educational performance and its impact on American infrastructure.

Mrs. Easton pointed out that education is one of the biggest businesses in the country, and that the Tandy Technology Scholars program will add to what she calls a "means of widening a system of educational accountability." More plainly put, the program will reward those who excel, something the average public school does not seem able to do very well. Easton suggested that "America's decline in academic competence has become serious enough to compromise our nation's future ability to compete in the international marketplace."

The Early Entrant Challenge—What Are The Rules?

Edward G. Boehm, Jr. will be in charge of developing selection criteria. Dr. Boehm is Vice Chancellor for Academic Affairs, Dean of Admissions, and now Project Director, Tandy Technology Scholars. When the question came up about whether finalists would be tested, he dodged a bit, citing work in progress, but said that testing was one of the techniques under consideration. The Tandy Technology Scholars Program is not computer specific, so all readers of *Computer Shopper* have an equal chance if they fit the criteria that are eventually announced. As one might expect, if you are a math, science, or computer science teacher using and seeking Tandy equipment, you are in luck. They have a Radio Shack Education Division, headed up by Vice President William D. Gattis. They only recently published a special issue of *AnswerS Magazine*, a quarterly published by Tandy Corporation titled "Focus on Education." Teachers who write Mr. Gattis at the Tandy address might well be able to acquire a copy of that issue. It is worth writing for.

There were a lot of questions from the reporters present. I asked Chairman Roach if the Tandy Scholars Program would not in effect certify outstanding science, computer science, and math teachers in such a way that they might be given even more offers to leave the profession than they already are. Roach feels that the current pressures to leave are already high, and these awards, being as they are a pat on the back, will have the effect of motivating them to stay. "The negatives are going to be there whether we have this program or not. We will now have one more positive with the program."

Perhaps Chancellor Tucker summed up the issue of doubt versus action. "We are going to work at this very hard. Will it work? We will just have to wait and see. Is it worth doing? You bet it is!" he said.

Information Resources

To obtain information and to express your views here are some of the addresses of persons and groups mentioned:

Vice President of Radio Shack for Education William D. Gattis (*AnswerS Magazine* "Focus on Education" issue or for information on Tandy education products), at: Tandy Corporation, Fort Worth Texas, 76102.

Dr. William (Bill) E. Tucker, Chancellor, or Dr. Edward G. Boehm, Jr., Vice Chancellor & Tandy Technology Scholars Project Director, at: (selection criteria suggestions, comments, expressions of interest) Texas Christian University, Fort Worth, Texas 76129 or phone 1-817-921-7808. ●

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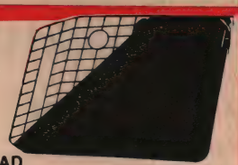

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Samma Adopts "Overdrive" For Multiple Document Processing

Samna Corporation and TurboSoft have agreed to jointly develop and market a new version of TurboSoft's OverDrive product that will bring the speed of integrated document processing and library management functions to Samna's Word IV and Plus IV product lines.

"OverDrive for Samna" will be available in both single-user and network versions later this year to Samna's hundreds of thousands of corporate users worldwide, directly through the company's field sales organization. Sales of the product through retail and reseller operations will be handled by TurboSoft.

Currently available in a WordPerfect version, "OverDrive" uses TurboSoft's patent-pending MIDAS technology, which allows simultaneous multiple integrated document professing and provides library management of up to 1,250 documents per library. MIDAS stands for Multiple Integrated Document Assembly System.

For users making multiple documents using the same information, OverDrive will save time and keystrokes, while reducing the likelihood of errors. This unique system allows multiple documents, such as a cover letter and underlying contracts, agreements and forms, to be prepared at the same time from a single entry of variable field information.

For example, OverDrive allows someone to print a name, address, account number, etc. for a total of 120 unique variable fields on as many as 20 documents, such as letters, contracts, envelopes and airfreight bills, by entering the information once.

The Samna version of OverDrive will ship with 75 document templates that include valuable business and legal agreements prepared by lawyers and experts in the fields of personnel, real estate, commercial law, corporations/partnerships, and wills and trusts.

Among the documents that will be included are an employment agreement; non-compete agreement; non-disclosure agreement; independent contractor agreement; sale of motor vehicle; residential lease; partnership agreement; simple will; dealer sales agreement; warranty deed; power of attorney; promissory note; articles of incorporation and shareholder buy-sell agreement.

The preformatted documents will be preloaded into an OverDrive library, ready-to-use and fully modifiable in the Samna format. In addition, OverDrive's library manager organizes up to 1,250 documents into volumes and chapters, allowing users to load their own frequently-used documents.

OverDrive for Samna will be keystroke-compatible with both Samna Plus IV and Samna Word IV, which means there will be almost no learning curve required of the Samna user. Like OverDrive's current WordPerfect version, which was introduced in May 1988, the Samna version of OverDrive will have a suggested list price of $99.95 for single user, $195 per file server and $42.50 per additional station (node) on networks. The network version will handle up to 100 libraries and a total of 125,000 documents.

For further information, contact Samna Corporation, 5600 Glenridge Drive, Atlanta, GA 30342; 404-851-0007. ●

New 80MB Tape Backup System For Apple Macintosh

Irwin Magnetics announced national availability of the highest capacity minicartridge tape backup system for Apple Macintosh computers. Irwin's new Model 5080 can back up as much as 80MB of hard disk data on a single standard DC 2000 minicartridge. In addition, the Model 5080, in conjunction with Irwin's other tape backup systems, permits data transfer between Macinstoshes, IBM PS/2s, and PCs through the simple exchange of pop-in minicartridges.

Irwin's self-powered, SCSI-interface Model 5080 features EzTape Iconographic software for unmatched ease of use, and proprietary error correction technology for reliable data storage and recovery. An Irwin user should not experience an unrecoverable single bit error more than once in 32 years.

The 5080 can support backup functions across all popular local area networks including AppleShare and TOPS. Any file made available on the network can be backed up remotely by any networked station.

Irwin's EzTape Iconographic software operates on standard Macintosh finder and multi-finder operating systems and a version for Apple's A/UX on the Macintosh II will soon be available. EzTape employs the Macintosh's standard "desktop" screen environment: users simply use their mice to pick and choose from pull-down menus, icons, and multiple windows. EzTape's clear, easy-to-follow displays allows users to back up or restore selected files or a whole disk.

Irwin's Model 5080 tape backup system for Macintosh computers will be available at computer retail stores throughout North America. The system's suggested retail price is $1695. Price includes EzTape software, SCSI interface, 256KB RAM, and self-contained power supply.

For further information contact Irwin Magnetics 2101 Commonwealth Boulevard, Ann Arbor, Michigan 48105. Phone 313-996-3300. ●

New GFA BASIC 3.0 For The Atari ST

Reviewed by Frank and Sally Nagy

Shakespeare once asked, "How do I love thee?" and answered, "Let me count the ways." How sad if he could only find one way to express his wonder. Fortunately, the English language is not that limited. Now, neither is GFA BASIC.

In a roundtable discussion centered on the new 3.0, George Miller, Director of Technical Support at MichTron was asked, "Is it easier to use than 2.0?" His reply, "I thought 2.0 was pretty easy. Now, I've got hundreds of commands to use, and often have to check if I'm using the best of several choices."

"Version 3.0 almost doubles the number of language commands and ends up with alternative ways to structure command semantics into workable programs. 300 new commands added to 2.xx give 3.0 ten times the power," said Miller.

The 646 page manual presents a work-aholic BASIC! This highly structured advance BASIC for the Atari ST loads and executes compiled subroutines written in C or Assembly language. The INLINE command reads compiled assembly code allowing it to be stored within the GFA program. The programmer is saved the extra labor of typing in DATA statements. It only requires that files be no larger than 32K.

The user-friendly editor accomplishes structured programming without using the line numbers. Familiar features of auto indent, and one command per line make previous GFA users feel right at home. Take your preference of using mouse or keyboard to mark and manipulate blocks in the same simple two step moving process.

Hiding procedures make overviews of large listings easy. A subroutine can be singled out, separate from the rest of the listing. Hide or seek these sections with a stroke of the handy help key.

Word processor-like aspects of page up and down, find and replace, insert and overwrite modes, switching back and forth between screens, and program loop testing are standard options for GFA BASIC.

New 3.0 controls allow headers/-footers, page numbers/page length and margins in program listings.

A drop-down menu offers five alternative options, two of which, DEFLIST and NEW NAMES are new to 3.0.

DEFLIST sets format of the listing.

NEW NAMES is a help which can lead a programmer through label and variable name checks. In the process of programming, 3.0 will then offer alert box prompts asking for required information. The programmer can choose to enter changes. He can either "ok" his brain-child as conceived or abort any "error."

GFA programmers continue to save time by typing common abbreviations. The computer will automatically change these to their actual command names.

And after the computer has helped in the creation stage, it continues this support into a testing mode. 3.0 allows any modifications to be immediately checked, unlike other languages which have to be compiled before running their programs. How much quicker and easier can you get?

Version 3.0 represents a complete rewrite of 2.0, keeping the best and improving everything else. 3.0 is 92K while 2.0 is 56K, new GFA BASIC Run only program is 62 vs 41K. It's faster, easier to use, with more features.

It uses all the previous commands and their functions. However, it seems there are some small differences in a few command meanings in adapting these to the new version. This is explained in the section entitled, "Compatibility with GFA BASIC 2.xx."

These differences can't be too large as all programs written in older versions of GFA BASIC can be used in 3.0, if they have been saved using the SAVE,A option or ASCII data format, *.LST and merged into the new version.

It fully supports all features of the ST operating system. All AES functions, GEMDOS commands and the most important VDI functions are keywords. XBIOS calls are as easy as before. However, we found using GEM difficult due to overly brief descriptions.

KEYXXX Instructions controls the status of the special Shift keys during the execution of the program. KEYPAD, KEYTEST, KEYGET, KEYLOOK, KEYPRESS, KEYDEF. KEYDEF, function keys with their shifted counterparts can combine to assign 31 character strings.

KEYPAD's NUMLOCK features greater control, while using the editor to insert a line or jump to the beginning or the end of a program.

Richard Noe, GEnie's GFA BASIC Roundtable Sysop said he thought RINSTR was a particularly nifty new string management command. It enables searching a string both right and left for a character. Other new control commands are: PRED, SUCC, TRIM$.

Now there are ways of addressing memory faster than PEEKs and POKEs with the new commands MFREE, MSHRINK, MALLOC.

After taking BASIC 3.0 through some simple benchmarks, Miller observed it's 40 to 60% faster using the same commands as 2.0. Old programs altered to take advantage of new commands, could do most operations up to 200% faster.

This alone makes it worth programmers while to re-write old code. Optimized programs will also be significantly reduced in size.

Floating point math may take a little more time in most applications, but extra accuracy is to be had in the process. We find 6 byte floating point accuracy to the 11th decimal and 4 variables replaced by an 8 byte floating point variables accurate to 14 decimal

continued on page 602

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New GFA BASIC 3.0 continued from page 601

places with 6 variables. Even here in a recursive loop running long enough, 3.0 will overtake 2.0 in delivering its more accurate answer.

Angular measurement from radians to degrees converts easily using the function DEG(). To convert back (degrees to radians) use RAD(). Functions SINQ and COSQ interpolate sine and cosine.

The Every and After command variations make interrupt programming possible. These commands execute procedures after a specified time.

Multiple condition instructions help develop highly structured programs. Program branching is accomplished by using ON X GOSUB procedure1, procedure2 and SELECT CASE commands.

GFA BASIC has several loop types: conditional, endless and unconditional. They can be further construed to include logical conditions in front of and behind the loop, using While and Until. Break conditions such as ENDFOR, ENDREPEAT and EXIT IF can be included within the loop.

The editor now has a clock and a line counter. Remember how you had to use shift and F10 to run programs in low resolution? Now just click the mouse on RUN.

You might teach your mouse some new tricks with MOUSE, MOUSEX, MOUSEY, MOUSEK, HIDEM, SHOWM, SETMOUSE, and DEFMOUSE. These help locate the mouse, its button status and turn off or on its cursor. Read the joystick's position and button status with the new commands, STICK and STRIG.

We can look forward to much sharper graphics programs as new commands are implemented. Line A Calls are easier. GFA 2.0 users will remember the earlier discrepancy between COLOR and SETCOLOR commands. The VSETCOLOR command corrects the problem.

BOUNDARY turns off or on framing around fill areas. The DRAW Command simulates a plotter on the screen. It uses input commands similar to those found in LOGO (Turtle Graphic) programming language).

With its two built-in sort routines; SSORT, a shell sort, and QSORT, a quick sort, array elements are quickly sorted by size.

RC_INTERSECT verifies where two rectangles intersect. RC_COPY makes it possible to copy a rectangle between many screen pages. Three different BITBLT routines mirror a cut out read. They are similar to GET and PUT commands, but are faster and more flexible. RC_INTERSECT, RC_COPY, BITBLT, Graphic Library, Dialog Boxes, Menu Lists and Window Management are found on the disk. All illustrations within the book include a brief, helpful description of what happens in the program.

Commands are sorted by theme and listed with syntax and parameter.

The command list includes commands for sound, directories, time and date, I/O channels, various input formats and more.

Appendices are extensive, covering topics of Compatibility with GFA BASIC 2.xx, GEMDOS routines, BIOS, XBIOS routines, table of Line-A-Variables, input-parameters for V_OPN(v)WK, Table of WORK_OUT fields, VT52 Emulator, Scan Code Table, ASCII Table, Fill Pattern Table, Line Pattern Table, and Error Messages.

Debugging is reported to be much easier with TRON, TROFF, TRACE$, DUMP and TRACE PROCEDURE. We are beginning to wonder how we got along before.

But then we have something to remind us why we started programming in GFA BASIC in the first place. This language is great even without the extra helps found in 3.0.

One programmer working on a homemade digitizer, switched to GFA 2.0 after using "C" for 3 months. This individual found it took only 3 days to get to the same level of understanding.

Problems With 3.0

The 3.0 manual is not perfect. In fact, it has several typos in the text and in program listings.

After typing in and running the joystick routine, Sally was unable to regain control of the mouse upon return to the editor mode. This, of course made it undesirable to save the program in this state.

Sorry color monitor users, demos are mono-dependent applications and not rez-independent. Most of the demos came from Germany. Miller wrote color demos for everything, but GFA made a few command changes at the last

continued on page 603

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Digital Video For IBM PC

New Media Graphics has announced the VideoWindows digital video overlay board. VideoWindows turns any EGA-equipped IBM PC, XT, AT or PS/2-30 into a powerful, interactive digital video system.

VideoWindows scans, frame-grabs, and stores analog video signals digitally, in real-time. The digital image can be expanded, compressed, positioned anywhere on the computer screen, inverted, and otherwise manipulated electronically.

The resulting full-motion or still-frame video image can then be combined with computer-generated graphics, and displayed jitter-free on any 60Hz non-interlaced RGB monitor. Images may also be captured and stored on a hard disk, to be retrieved, manipulated and displayed later.

Previously these capabilities were available only in expensive television studio systems. Now VideoWindows makes it all affordable for industrial training, electronic shopping, business presentations, and desktop video applications.

VideoWindows comes complete with demonstration software, and a functions library for use with the Microsoft C compiler, Pascal, or assembler. Authoring systems are available.

VideoWindows boards are ready for immediate shipment. The single unit price is $1195. Quantity discounts are available.

For additional information contact New Media Graphics, 780 Boston Road, Billerica, MA 01821-5925; (617) 663-0666. ●

New GFA BASIC 3.0
continued from page 602

minute. Miller wasn't able to get everything working in color in time for the release. (It's interesting to note the Germans prefer monochrome.)

Miller himself says he hates the way the editor defaults screen colors to whatever screen color you had when you last exited rather than returning to the original setting.

MichTron is very interested in making GFA BASIC the best it can be. Miller states, "If we weren't, we wouldn't have done a 3.0. We need feedback from users to keep improving." He relays all comments good or bad to GFA, and passes on bug reports his tests confirm.

"A list of confirmed bugs have been posted on the MichTron boards," he said.

Even with its problems GFA BASIC still competes with the best of them. It is almost impossible to tell the difference between a program written in C, Assembler, Pascal, Forth or any other heavy duty computer language.

For instance the excellent game Slagon, and three-dimensionally graphic GFA Object were written entirely in GFA BASIC.

Originally released in June 1986, over 50,000 copies of the GFA BASIC Interpreter, and 20,000 copies of the GFA BASIC Compiler have been purchased worldwide.

GFA BASIC and support programs have been popular, but unless we miss our guess, 3.0 will top all sales of the original. And that only can mean further success for MichTron who puts out all of these products.

Allow about a week to 10 days for delivery of GFA BASIC 3.0. MichTron is having trouble keeping up with the orders right now. They are getting about 75 to 100 orders everyday and every credit card number must be verified.

GFA BASIC 3.0
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3.0 Compiler

Miller mentioned a compiler will be available as a support program, but he

continued on page 605

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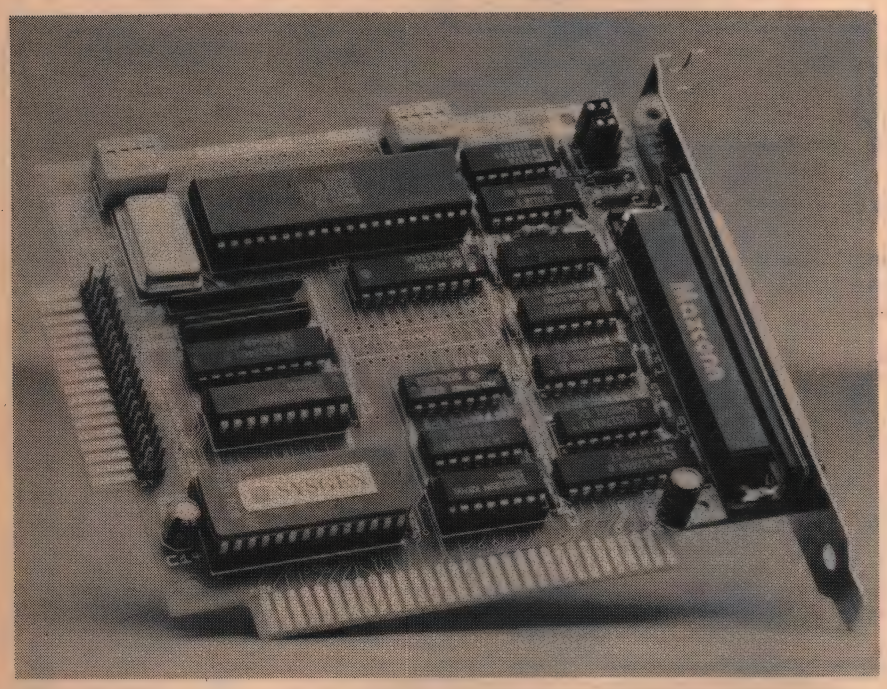
Omni-Bridge Universal Floppy Controller



Affirming its commitment to the upgrade marketplace for IBM PC/XT and compatible computers, Sysgen, Incorporated has announced Omni-Bridge, a floppy disk drive controller that provides access to all standard floppy disk drives for the personal computer.

While IBM would like to strangle the PC/XT market, these computers represent a golden opportunity for computer resellers, according to Douglas Bercow, marketing manager for Sysgen.

"As an alternative to IBM's recently announced PC/XT call-back program, the computer reseller can make a greater impact on the bottom-line by remarketing PCs and XTs with today's technology," said Bercow. "An Omni-Bridge provides the data storage solution required for such an upgrade."

Designed as a half-slot board, Omni-Bridge supports the following devices:

- 720 kilobyte and 1.44 megabyte 3½" floppy disk drives
- 360 kilobyte and 1.2 megabyte 5¼" floppy disk drives
- floppy tape drives (QIC-40 standard)

For maximum flexibility, Omni-Bridge controls up to four floppy storage devices in any combination. Furthermore, the Sysgen controller can either replace or coexist with the present floppy disk drive controller.

The company's latest product offering is a response to market demand, according to Bercow.

"There are literally millions of XT and compatible users who want the power of 80286- and 80386-based machines and the ability to run OS/2 but they want to protect their initial investment at the same time," said Bercow. "Of course, merely upgrading the central processing unit does not achieve IBM AT or PS/2 compatibility."

"True compatibility also requires a floppy disk storage upgrade, a void filled by Omni-Bridge."

Bercow pointed out that 3½" floppy disk shipments will surpass 5¼" floppy disk drive shipments this year. In fact, market research firm Disk/Trend, Inc. projects that worldwide shipments of the 3½" floppy disk drive will reach 17 million units in 1989, approximately 5 million units more than its 5¼" counterpart.

Beyond connecting to the 3½" floppy disk drive standardized by the PS/2, Omni-Bridge also matches the PS/2's floppy disk data transfer rate. The Sysgen controller transfers floppy disk data at 500 kilobits per second or twice the speed of a standard IBM XT.

Omni-Bridge and Sysgen's PSF-360, a 360KB external floppy disk system for the PS/2 that is fully compatible with the IBM 5¼" floppy disk system, represent the newest additions to Sysgen's Bridge product family. This product line consists of data transfer peripherals for the PS/2, 80386-based computers, and laptop computers.

The Omni-Bridge carries a retail list price of $95.00.

For further information contact Sysgen, Inc., 556 Gibraltar Drive, Milpitas, CA 95035; (408) 263-4411. ●

New Computer Projection Systems

Telex Communications, Inc., has introduced two new color Liquid Crystal Display (LCD) computer projection systems that provide users with a convenient method of giving powerful, "real time" presentations of computer generated graphics and text.

The MagnaByte Model 5040, for use with most IBM, IBM compatible and laptop personal computers, and the MagnaByte Model 5020, for use with the Apple II family of personal computers, need no special software or interface cards. To bring either system online, one simply plugs the supplied cable into the computer's RGB/video output, places the unit on any standard overhead projector, focuses and presents.

To enhance MagnaByte presentations, Telex offers an optional easy-to-use wireless remote control and Show Partner, a desktop presentation software program, for use with the Model 5040. Show Partner, by Brightbill-Roberts & Co., Syracuse, New York, gives presenters the ability to produce their own presentations or capture screens from other programs and arrange them in slide show order.

Most popular desktop presentation software programs work with MagnaByte as well.

The MagnaByte Models 5040 and 5020 are constructed of lightweight (five pounds), high quality impact-resistant materials. Each comes with non-slip rubber feet which prevent the palette from sliding or being easily knocked out of screen alignment or off the projector. The palette is 13 inches wide, 11.7 inches high and 1.9 inches deep. It features a built-in cooling system enabling it to run cooler and more efficiently.

The MagnaByte Model 5040 system, including palette and all necessary cabling, has a suggested retail price of $1,350. Telex Communications' MagnaByte products are available through independent audiovisual and computer dealers in the U.S. and in more than 80 countries around the world.

For more information, contact Telex Communications, 9600 Aldrich South, Minneapolis, MN 55420. ●

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80386 Upgrade For Zenith Z248

Aox Incorporated has announced that they will offer an 80386-based processor replacement card, the Z-Master 386, for the 80286 based Zenith Model Z248. The Model Z248 is used extensively both commercially and throughout the U.S. government.

The product will be available in 16, 20, and 25MHz versions to meet a wide range of computing needs. The Z-Master 386 will support 80386 operating environments such as PC-MOS/386, Windows 386, Xenix/Unix 386 and DESQview. Because of the passive backplane architecture of the Model Z248 the machine is quickly turned into a true 386 system by just replacing the old 286 CPU card with the Aox 386 board.

"The Z-Master 386 is a cost-effective upgrade solution for Zenith 286 owners," says Robert Parsloe, director of 386 Product Marketing at Aox. "The Z-Master 386 achieves a much higher level of hardware and software compatibility than is currently available in the Z248." Parsloe also points out that one competitive offering requires the user to remove and replace two boards plus the motherboard, a very expensive and time consuming process. "The Z-Master 386 is a one board solution."

The card's cache-based design is unique and efficient, allowing the Z-Master 386 to tap all existing system memory. For increased performance, 8MB of 32 bit memory can be added directly onto the board. An 80387 math coprocessor is optionally available.

For more information, contact: Aox, Inc., 486 Totten Pond Road, Waltham, MA 02154; (617) 890-4402. ●

New GFA BASIC 3.0

continued from page 603

went on to state there is no need for support programs like a GFA Companion for 3.0, as a Resource Construction Set is included in the 3.0 package. (Atari's Resource Construction Set version 2.1 has been licensed for distribution with GFA BASIC Version 3.0.) Sadly enough, MichTron can only provide limited support of this RCS.

This utility program makes resource files containing alert boxes, dialog boxes, and drop down menus. It also takes icons and bit images and makes them usable as resources. 16 pages of documentation can be found on the 3.0 GFA language disk.

Those writing desk accessories must wait for the Compiler's release. Any newly written files must be compiled before using. Already written accessories are loaded into the computer first before running any other program. In other words, an accessory takes a special startup. The GFA Compiler has this special startup package. Desk accessories can be handled better using EVNT_MULTI command.

GFA 3.0 Compiler will compact GFA BASIC Interpreter programs into stand-alone machine code.

This $99.95 item should be out in late fall. (Return 2.0 disks for usual update discount.)

Other Products To Watch For

"Programming With 3.0" is already available and "Concepts in Programming" was expected to be out at the end of September.

MichTron also expects soon the release of the GFA Assembler which will interface directly with GFA BASIC 3.0.

An alphabetical cross reference guide to the 3.0 GFA BASIC manual is in the works and a compact version like the Quick Reference Card is being considered. ●

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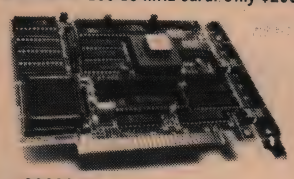

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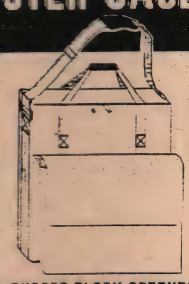

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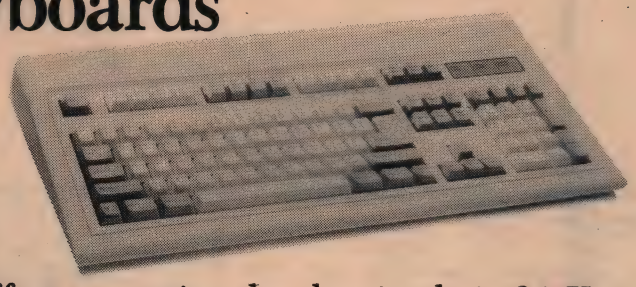

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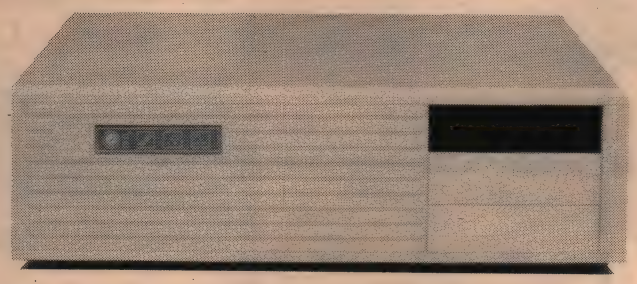

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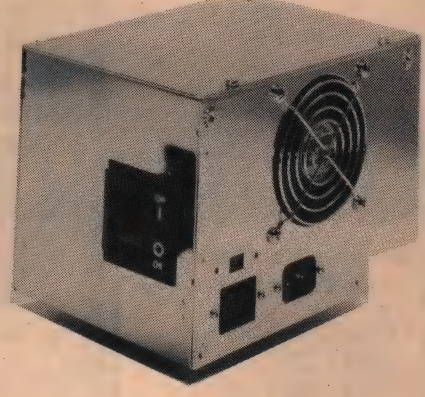

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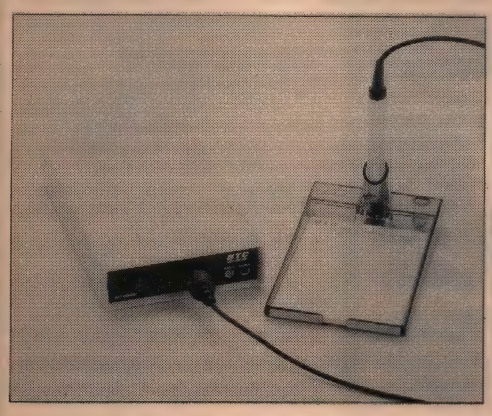

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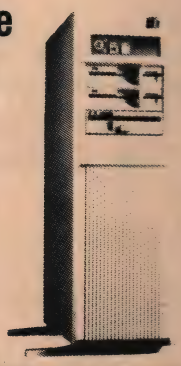

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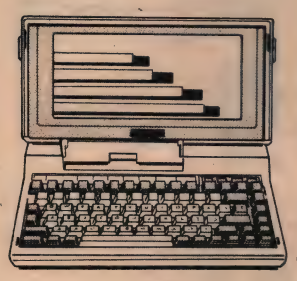

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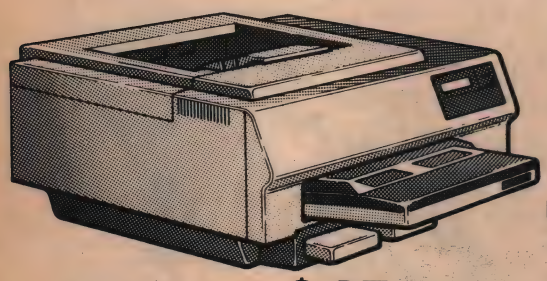

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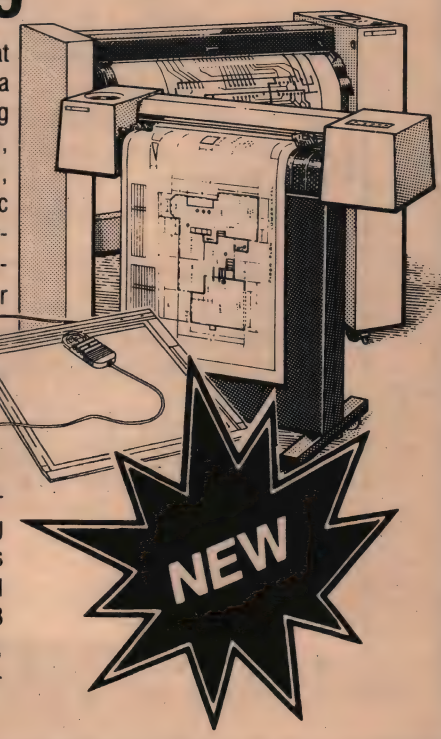

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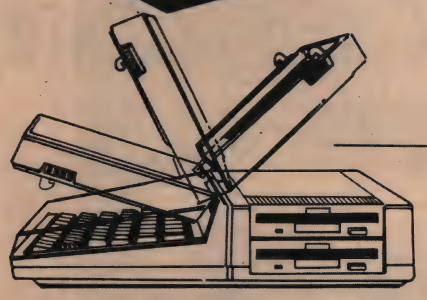

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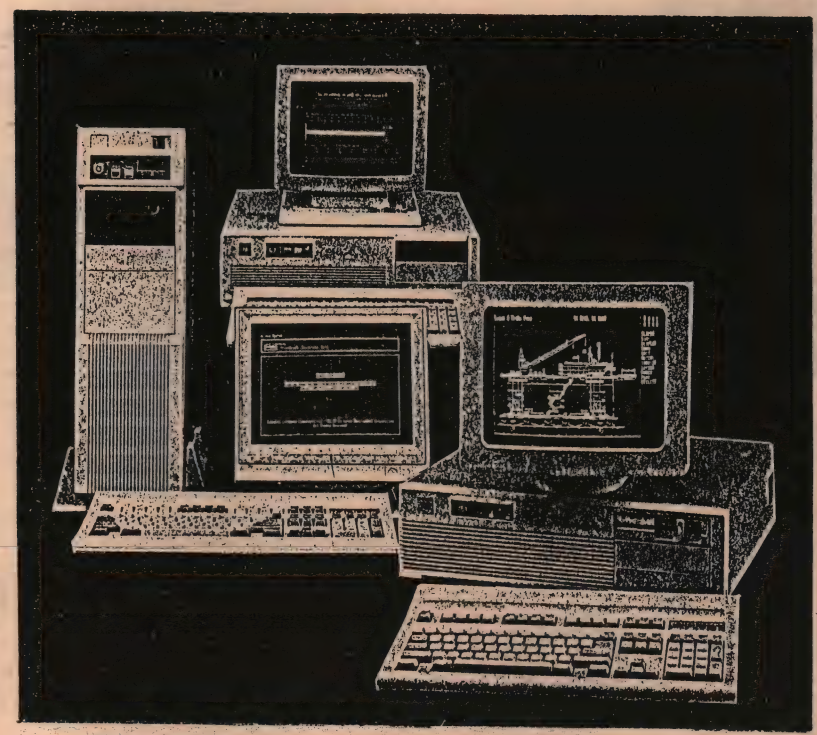

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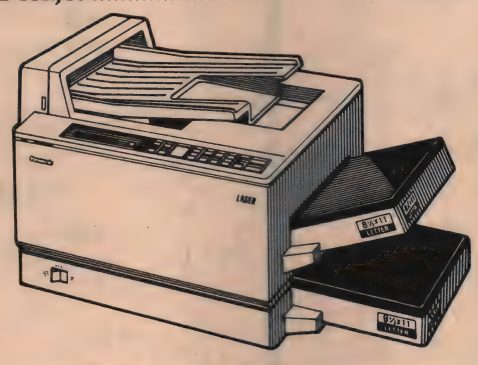
KXP1524	565.00

Hewlett Packard

Thinkjet	Call
Deskjet	755.00



MODEMS

Practical Peripherals

Stand Alone	
PM1200SA	102.00
PM2400SA	173.00
Internal	
PPM 1200	61.00
PPM 2400	145.00
ATI	Call
Multitech	Call

OUTSIDE INDIANA

1-800-635-3629

Hours: Mon.-Fri. 8:30 a.m. - 7 p.m.
Sat. 10 a.m. - 4 p.m. Eastern Standard Time

MONITORS

Magnavox

BM7622	Call
CM8672	247.00
9CMO53	347.00

Goldstar

1210A TTL	71.00
4135T-Color	215.00
1420 EGA	331.00
4175 Dual Mode	349.00

Packard Bell

1420CG	243.00
1422EG	345.00
1272A	69.56

NEC

Multisync GS-AM	198.00
Multisync GS-GR	198.00

ACCESSORIES

Cables, ribbons	Call
6' parallel cable	4.99
Molded 6' parallel cable	7.59
25-position A/B switch box	21.95
25-position A/B/C/D switch box	31.95

LINE FILTERS, SPIKE AND NOISE SUPPRESSORS

Isoblok 2-0	29.95
Isobar 2-6	39.50
Isobar 4	53.50
Isobar 8	76.00

Command Console-Isobar

Model #CCI6-plus; command console; isobar protected w/ modem/fax protection 93.00

Call for more information on our complete isobar line.

$5.00 minimum shipping and handling.

Add 3% shipping/handling – We accept money order or certified check.

Prices reflect cash discount. Please add 3% for MC/VISA. Please allow two weeks for personal and company checks to clear. All products include factory warranty. All sales are final. Defective items are repaired or replaced at our discretion. Indiana residents add 5% sales tax. Terms and prices subject to change without notice. We cannot guarantee compatibility.

GOLDEN EAGLE micro, inc.

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It's P.C. Supply's Fantastic Pre-Holiday Sale

With our selection and prices you'll want to do your shopping early! Let us bring you some holiday cheer with special on a wide variety of P C system and peripheral products.

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80386-16 16/20 MHz WITH 1MB, EXPAND UP TO 8MB, FULL SIZE ..... $ 1,260
80286-12 8/12 MHz WITH 1MB, EXPAND UP TO 4MB WITH EMS 4.0, BABY SIZE 699
80286-16 8/16 MHz WITH 1MB EXPAND UP TO 2MB WITH EMS 4.0, BABY SIZE 799

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RELISYS 14" EGA MONITORS 640x350 0.31 DOT PITCH WITH EGA CARD ..... $ 459
14" MULTISCAN MONITORS 800x600 0.31 DOT PITCH/VGA CARD EGA CARD 629/579
14" VGA MONITORS 640x480 0.31 DOT PITCH/VGA CARD 569
14" SAMSUNG RGB MONITORS 640x200 209
14"SAMSUNG FLAT SCREEN 99
NEC 14" MULTISYNC II 800x560 550
Please call for EGA, Super EGA, VGA Card's Price

HARD DISK DRIVES

5¼" 20 MB HARD DISK WITH CONTROLLER ..... $ 239
5¼" 30 MB HARD DISK WITH CONTROLLER 265
5¼" 40 MB SEAGATE HARD DISK 40 MS 335
5¼" 40 MB SEAGATE HARD DISK 28 MS 399
5¼" 80 MB SEAGATE HARD DISK 28 MS 565
5¼" 155 MB MICROPOLIS ESDI HDD WITH CONTROLLER 1,498
5¼" 320 MB MICROPOLIS ESDI HDD WITH CONTROLLER 1,950

FLOPPY DRIVES

SONY 3½" 720K FDD WITH 5¼ BRACKET ..... $ 85
SONY 3½" 1.44 MB FDD WITH 5¼ BRACKET 99

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PANASONIC 1080i 9PIN 144CPS 80CLUM DOT MATRIX ..... $ 155
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1524 24PIN 240CPS 136CLUM DOT MATRIX 525
NEC P2200 24PIN 160CPS 80CLUM DOT MATRIX 325
P5200 24PIN 265CPS 80CLUM DOT MATRIX 475
P5300 24PIN 265CPS 136CLUM DOT MATRIX 599
FUJITSU DL-3400 24PIN 240CPS 136CLUM DOT MATRIX 499
HEWLETT PACKARD LASER JET SERIES II/TONER ... 1,629
HEWLETT PACKARD DESK JET 695

MODEM

U.S. Robolics 100% Hayes Compatible
1200 BAUD INTERNAL ..... $ 65
2400 BAUD INTERNAL 121
9600 BAUD EXTERNAL 595
HST COURIER

INTEL MATH CO-PROCESSORS

80287-10 ..... $ 249
80387-16 399

..... Avoid the last - minute "Christmas Rush" and place your order now from P.C. Supply all sale items will be shipped within 48 hours of receipt of your order. Call now for the best selection!

Sale End Nov.

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IRWINDALE, CA 91706 FAX (818) 338-9347 MEDLEY, FL. 33178 FAX (305) 887-3821

Almost anyone can use our spreadsheet right out of the box

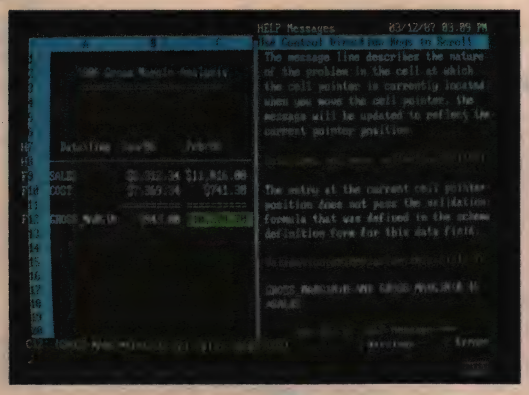
That's because Silk is the only spreadsheet that gives you an on-line, context sensitive, "live" screen tutor that makes learning almost child's play.

Learn As You Work

As you move through each step, you'll see instruction on the right hand side of your screen which guides you and literally teaches as you work.

And, since it's context sensitive, when you change a command your Silk screen tutor changes to match it. You can remove or activate the screen tutor at any time you wish.

Other spreadsheet programs are so difficult to learn that most users master only a fraction of their real potential. Instead, Silk's on-line screen tutor treats you with kid gloves. It will make you a power-user in a few sessions without ever studying the manual.



Beyond 1-2-3

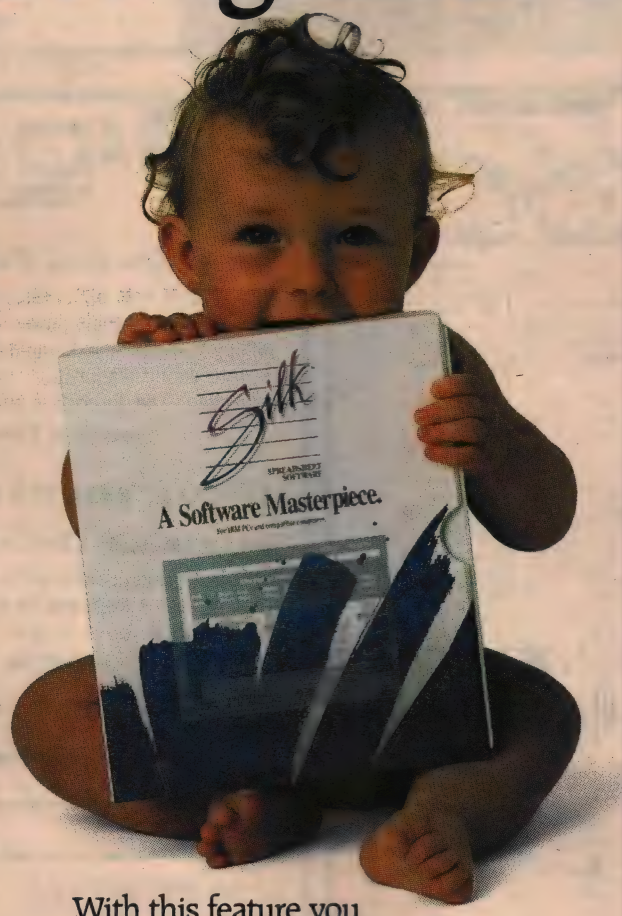
Silk is simple to use but powerful. It maintains the spreadsheet features that made 1-2-3 so popular but adds what 1-2-3 and the others lack.

Silk lets you build formulas as large as 1,000 characters and append each cell with text notes, so you'll always remember what your calculations are based on.

Silk has its own unique screen editor that lets you edit large cell contents—even formulas up to half a screen long. No other spreadsheet can.

Auto Allocation

Silk even has a powerful new allocation feature that automatically distributes values proportionately over any number of cells you choose for any reason you wish to cut the pie.



With this feature you can re-allocate increased payroll or a revised financial budget at the touch of a key instead of hours of complex modeling.

You can even keep some cells at a fixed value. Many users find this feature alone is worth the purchase price.

And Silk even includes a lost work recovery feature, so you'll never lose your work again!

PC MAGAZINE EDITOR'S CHOICE

"Silk's improved graphics, fine use of function keys, interactive help, global search and replace, and easy-to-arrange worksheet are reason enough to buy... At some point, you have to think about moving onward and upward (from 1-2-3). Silk gives you reason enough."
— PC Magazine

Best of all, you can purchase Silk now directly from Daybreak for only $99 during this special promotion. A real value savings compared to its regular $298.00 retail price.

Of course, not everyone can use Silk immediately. Little Rebecca, shown here, will probably have to wait at least until the third grade.

Everyone else, use your Visa or MasterCard, and order Silk today.

NEW, Never lose your work again!

Everyone loses work when there's a power failure or when a keyboard locks up. And there really is nothing you could do except start all over again.

Until now!

Introducing Cocoon.

Cocoon's new software technology literally records your work in progress, no matter how complex.

Cocoon works in the background saving a log of each of your keystrokes to disk precisely in the order you make them.

Then, if there's a power interruption or keyboard lock-up, Cocoon can reconstruct your work (each key stroke exactly in the same sequence) even after your computer has lost them.

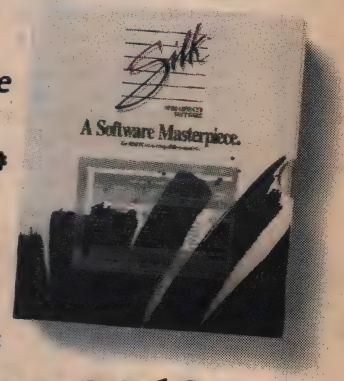
Cocoon works with any popular application such as 1-2-3, WordPerfect, Symphony, and dBase, to name just a few. It will work for yours.

Order Cocoon now at the special promotion price of **only $79.95** (reg. $99.95). A great value for a real work-saver.

Silk Special Price Only $99.95
Cocoon Special Price Only $79.95

Bonus Offer*
Both Only $149.95

*Offer ends December 31st



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Mail To: **DAYBREAK TECHNOLOGIES, INC.** Dept. 636z, 21213B Hawthorne Blvd., Ste 5629, Torrance, CA 90509

Name _____
Company _____
Address _____
City _____ State ____ Zip _____
Phone ( ) _____

_____ Sets Both @ $149.95 _____
_____ Copies Silk @ $99.95 _____
_____ Copies Cocoon @ $79.95 _____
Add shipping & handling $6 each U.S. & Canada ($40 each everywhere else) _____
CA residents add 6.5% sales tax _____
Total $_____

Check diskette size ☐ 5¼" ☐ 3½"
Payment Method (allow 2 weeks for delivery)
☐ Check or money order enclosed, made payable to Daybreak Technologies, Inc. (Sorry No CODs)
Charge my: ☐ Visa ☐ MasterCard
Account # _____ Exp. Date _____
Signature _____

Both Silk and Cocoon require an IBM PC or compatible with DOS 2.0 or later. Silk requires at least 512K with a hard disk recommended. Cocoon requires a hard disk.

30 DAY MONEY-BACK GUARANTEE

If for any reason you are not completely satisfied, return the product within 30 days for a full purchase price refund.

1-2-3 and Symphony, WordPerfect, dBase, DOS and IBM are registered trademarks of Lotus Development Corporation, WordPerfect Corporation, Ashton/Tate, Microsoft Corporation, and International Business Machine Corporation respectively.

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SYSTEM PROTECTION

Attention! SALE

TRIPP LITE

SPECIAL!

Bargain Days!

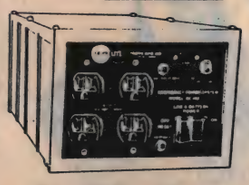
BATTERY BACK-UP SYSTEMS

Power failures or brownouts, however brief, cause data loss, even system damage to your computer. Avoid this expensive and unnecessary problem with economically priced, self-contained emergency back-up systems. These units come complete with enclosed gel cell battery. Supplies 30 to 60 minutes of backup allowing a comfortable, safe shut down of your computer.

- 200, 325, 450, 750, 1200 and 2000 watt models.
- Large ampere hour batteries.
- Switch-over time within milliseconds.
- Built-in filtering network for clamping transient spikes.
- 325, 450, 750, 1200 and 2000 watt models sound audible alarm during power failures and are frequency controlled to within 1/2 cycle at 60 Hz.
- Attractive desk top cabinet with two or four receptacles.
- No installation required – just plug in.
- Complete with indicator lights for line power and battery power monitoring.
- Complete brownout protection.

Part No.
BC-200 2 Outlet, 200 Watt
BC-325 4 Outlet, 325 Watt
BC-450 4 Outlet, 450 Watt
BC-750 4 Outlet, 750 Watt
BC-1200 4 Outlet, 1200 Watt
BC-2000 4 Outlet, 2000 Watt
SB-4000 4 Outlet, 4000 Watt (Batteries not included on SB-4000 only)

Ideal for PCs and compatibles:
- **200 watts for your PC**
- **325 and 450 watts for hard disks and XTs**
- **750 and 1200 watts for ATs and multi-user systems**
- **2000 watts for minis**



Add Ship & Handling	1-4 UNITS EACH	5+ UNITS EACH
BC 200 Watt	$218.00	$215.00
BC 325 Watt	$265.00	$260.00
BC 450 Watt	$345.00	$340.00
BC-750 Watt	$507.00	$495.00
BC-1200 Watt	$795.00	$780.00
BC 2000 Watt	$1245.00	$1195.00

SAVE!

LINE STABILIZER/CONDITIONERS

When a surge suppressor is not enough these voltage regulators protect equipment and data by maintaining a constant power level during brownouts (voltage sags) and high voltage surges. At the same time they provide complete ISOBAR® surge and noise suppression. **True** line conditioning for your electronic systems at an affordable price.

- 600, 1200 and 1800 watt models.
- Maintains load voltage 120V AC (± 5%) from 96V AC to 138V AC input range.
- Spike & R.F.I. filters and Full ISOBAR® protection on the LC-1200 & LC-1800.
- Indicator lights on LC-1800 for monitoring high and low voltage conditions.

These stepped transformer systems are higher in efficiency, lower in wave form distortion, and lower in cost than C.V.T.'s (constant voltage transformers).

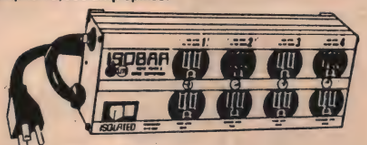
Part No.
LS-600 2 Outlet, 600 Watt
LC-1200 4 Outlet, 1200 Watt
LC-1800 6 Outlet, 1800 Watt

	OUTLETS	
LS 600	2	$85.00
LC 1200 Wt	4	$145.00
LC 1800 Wt	6	$195.00

ISOBAR® SURGE SUPPRESSORS

ISOBARS:® The most advanced power line filter to protect your computer . . . and the only surge suppressor to protect your system from itself. If you are buying any other brand, you're just not getting full protection. Only ISOBAR® gives you:

- 21 active electronic filtering components to really protect your computer.
- Individual filter banks with multiple filtering components to safeguard against any interaction between your electronic equipment.
- Superior R.F.I. and E.M.I. noise suppression and rejection.
- "Cascade Circuitry" to let you choose the level of protection you need, supplying more protection for your more sensitive equipment.
- Suppresses up to 13,000 amp spikes.



Part No.
IB-2-0 ISOBLOK 2 Outlet, Direct Plug In
IB-2 2 Outlet, 6' Cord
IB-4 4 Outlet, 6' Cord
ISOTEL 4 Outlet, 6' Cord With Built-In RJ11 Plugs and Modem Protector
IB-8 8 Outlet, 12' Cord
IB-8RM 8 Outlet, 12' Cord With Remote Power Switch
CCI-6 ISOBAR® COMMAND CONSOLE 6 Outlet, 12' Cord

IB 2-0	$32.00	IB 8 RM	$72.00
IB 2	$37.00	CCI 6	$85.00
IB 4	$47.00	ISOTEL	$62.00
IB 8	$65.00		

NEW!

DataShield™

FROM PTI INDUSTRIES

NEW! Second Generation Standby Power

Turbo 2/300, 450, 625. Less than one millisecond transfer time closely emulates on-line uninterruptible power supply while avoiding the larger cost and size. Advanced features include rapid transfer time, full battery protection, overload protection, wiring diagnostics, rapid battery recharge, surge protection and noise protection. The Turbo 2 is Novell approved and includes file server interface.

transfer time is less than 1 millisecond.

TURBO 2/300 $375.00

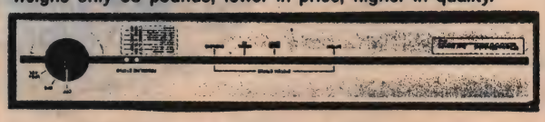
TURBO 450 $425.00

TURBO 625 $475.00

Datashield Online (UPS)

PTI Industries continues its technological leadership with the introduction of a new concept in UPS design-uninterruptible power and line regulation in one compact cabinet that fits conveniently under the monitor. Novell approved, file server interfaces are available.

SS400 and SS700 1st solid state UPS, zero transfer time, 80% smaller in size, weighs only 38 pounds, lower in price, higher in quality.



SS700

SS400 $675.00 **SS700 $825.00**

Datashield Standby Power Supplies (SPS)

AT1200 and AT1500 designed for multi-user and minicomputer systems,1200 watts or 1500 watts of power with sine wave output, state of the art battery protection.

AT800 and AT500 designed with most multi-user PC and business systems in mind, 800 or 500 watts of power respectively with sine wave output, four plugs. Now shipping battery installed for easy installation.

XT300 provides 300 watts of power to work with all PC's with internal or external hard disks.

PC200 provides 200 watts of power to work with all floppy disk based PC's

AT1500 $1250 **AT800 $625** **XT300 $375**

AT1200 $895 **AT500 $450** **PC200 $275**

MODEM/FAX PROTECTORS

ISOTEL $62.00

Protect modems, telephone systems, facsimile machines, etc. from telephone line spikes that damage equipment and data transmissions. All units exceed telephone line standards for maximum high voltage protection response time is less than 5 nanoseconds.

- ISOTEL – full 4 outlet ISOBAR® protection with built-in modem filter.
- TSB – premium modem and fax data transmission protection.
- MP – economical modem, fax and tele spike protection.

TRIPP LITE

MP $20.

TSB $45.

OMNIPOWER

THE FIRST BATTERY BACK-UP *WITH* AC VOLTAGE REGULATION

NEW

POWER BACKUP WITH LINE CONDITIONING

TRIPP LITE

OMNI POWER

OMNI 450 WATT $495.00

OMNI 1200 WATT $850.00

Unlike most back-up systems that switch to battery power during low voltage (brownout) conditions, only Omnipower automatically adjusts low voltage to 120V AC.

Omnipower's built-in voltage regulator provides true brownout correction so the user can continue normal PC operation during voltage sags without having to power down. With this regulation feature, battery life is extended because batteries are only used during blackouts. Omnipower features Tripp Lite's famous and reliable BC Series battery back-up for emergency power in the event of total power loss (blackout).

- Voltage regulation from 87V AC to 140V AC.
- Regulation to 120V AC ± 5%.
- 450 and 1200 watt models.
- Full spike and noise filtering (ISOBLOK on 1200 watt model).

FULL BATTERY BACK-UP AND VOLTAGE REGULATION IN ONE UNIT.

COMPUTERGEAR

1-800-234-3434
1-816 753-2767

CALL FOR SHIPPING
P.O. BOX 7403
SHAWNEE MISSION, KS 66207

SYSTEM PROTECTION

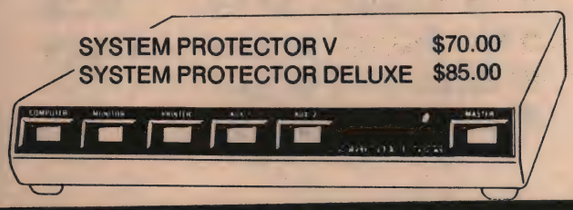
SURGE PROTECTORS

ALL SURGE PROTECTORS INCLUDE:

- 3 Mode surge/spike protection
- 6-foot heavy duty power cord
- Lighted master switch
- 15 amp circuit breaker
- Heavy Duty beige steel case
- UL Listed One Year warranty

4 OUTLET SURGE	$12.95
6 OUTLET SURGE	$15.95
6 OUTLET WITH INDICATOR LAMP	$16.95
6 OUTLET WITH EMI/RFI FILTERS	$17.95
6 OUTLET WITH EMI/RFI/MODEM	$23.95
6 OUTLET WALL MOUNT	$7.95
MODEM SURGE PROTECTOR	$14.95
6 OUTLET POWER STRIP	$14.95

SPECIAL SAVINGS



SYSTEM PROTECTOR V $70.00
SYSTEM PROTECTOR DELUXE $85.00

- Conveniently mounted on a swivel base for 360° viewing.
- Five switched outlets control on/off for CPU computer, monitor, printer, disk drive, second disk drive or printer, modem, or printer buffer.
- Main switch allows entire system to be shut down at night by simply hitting one switch.
- Each of five AC outlets are surge and noise protected against damaging line voltage surges, spikes, motor and radio frequency interference. In addition, the PP165 provides modem surge protection.

AMERICAN POWER CONVERSION

UPS systems

- Allows automatic, secure network shutdown during extended power outages
- No supervisor intervention is required
- Ideal for file servers which are sometimes unattended or attended by untrained personnel
- Complete power protection from blackouts, sags, noise, and surges

330 XT **$255**
Low cost UPS protection for network workstations

450 AT **$385**
For SFT Level 2 and VINES file servers

520 ES **$449**
For AT type servers, 3 Com servers, and CAD workstations

800 RT **$705**
For large file servers with multiple hard drives

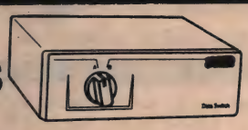
1200 VX **$900**
For multiple PC's or very long backup power duration

INTERFACE CONVERTER

UNITS FEATURE:
8 Switch selectable baud rates (300,600, 1200,24000, 4800,19200,38400)
DTE, DCE Switchable
Parity selectable
AC adapter included
The units have heavy duty steel cases
One year warranty.

Parallel to serial $62.00
Serial to Parallel $62.00

DATA SWITCHES



SWITCH BOX

	DB25	CENTR 36PIN	DB9	8 PIN MINIDIN	RJ11	RJ45	TWINAX	COAX	DB37	DB50	IEEE-488	PS/2 15 PIN
2 WAY	$19.75	$23.75	$19.50	$30.00	$28.00	$32.00	$38.75	$29.00	$55.00	$57.00	$53.00	$28.00
3 WAY	$25.75	$29.95	$27.00	$34.00	$34.00	$35.00	$43.00	$33.00	---	---	---	$29.00
4 WAY	$28.75	$34.75	$33.00	$39.00	$40.00	$45.00	$52.00	---	---	---	---	$32.00
5 WAY	$38.75	$44.75	---	---	---	---	---	---	---	---	---	---
XOVER	$29.75	$37.75	---	---	---	---	---	---	---	---	---	$35.00

MONITOR TILT 'N' TURN

SMALL 12" $12.95
MEDIUM 14" $14.95
LARGE 16" $20.95

UNDERCARRIAGE KEYBOARD DRAWER

PC & XT $27.00
AT $29.00

KEYBOARD STORAGE DRAWER

PC & XT $39.00
AT $41.00
WOODEN $39.00

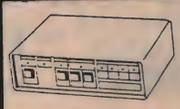
CPU FLOOR STAND

METAL $19.95
PLASTIC $15.95

TOOL KIT

10 PIECE $14.95
11 PIECE $17.95
21 PIECE $27.95
26 PIECE $65.00

PRINTER BUFFERS!



Save

Buffers include a "copy" feature that allows you to print up to 255 copies and a"bypass" feature that allows you to interrupt the buffer for an emergency printout. The features are all selectable on the front control panel. The panel also has indicators to tell how much buffer space is available. The buffers will accept data as fast as your computer can output and then the buffer waits for the printer.

PARALLEL

64K installed $97.00
256 K installed $295.00

Attention

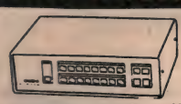
New Intellicom LONG-LINK™

PARALLEL EXTENDER

Need to connect a PC to a printer in the next office...or the next building? Get Long-Link from Intellicom. Long-Link stretches the parallel interface between PC and printer up to 7,000 feet. The Long-Link transmitter connects to a computer's parallel port; the receiver is connected to the printer. It installs in seconds, and doesn't require any configuration. Inexpensive telephone extension wire carries the data. Full two year warranty from Intellicom.

$159

SMART SWITCHES!



A low cost way to allow either 4 or 8 computers to share a parallel printer. Our smart switches do not require the use of software. Instead, the switch senses a computer trying to print and automatically connects the computer to the printer. If more than one computer is trying to print at the same time, the smart switch sends a "printer busy" signal to the other.

Four position serial $135.00
Eight position serial $165.00
Four position parallel $135.00
Eight position parallel $165.00

COMPUTERGEAR

P.O. BOX 7403
SHAWNEE MISSION KS 66207

1-800 234-3434

BASF DISKETTES

		1-5 BXS	6+BXS
54249	3 1/2" DSDD	$13.98	$13.75
54290	3 1/2" HD	$47.00	$45.00
54304	5 1/4 DEC RX50	$15.00	$14.00
54238	5 1/4" DSDD	$6.95	$6.50
54310	5 14/" 96TPI	$17.95	$16.50
54244	5 1/4" HD	$13.95	$12.95
54057	8" DSDD 1024	$19.95	$18.95
54061	8" DSDD	$19.95	$18.95

3M 3M DISKETTES

		1-5 BXS	6+BXS
12042	3 1/2"DSDD	$21.00	$19.00
12513	3 1/2" HD	$57.00	$55.00
00230	5 1/4" SSDD	$7.95	$6.30
00234	5 1/4" DSDD	$7.95	$6.30
12100	5 1/4" HD	$15.95	$14.28
00224	8" DSDD	$22.00	$19.95
00227	8" DSDD	$22.00	$19.95

DISKETTES

COMPARE! $4.75

54229 5 1/4 DSDD

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DISKETTES

3M HIGHLAND

12307	5 1/4"SSDD	$5.00
12306	5 1/4"DSDD	$5.00
12583	5 1/4" HD	$12.95

DATA ELECTRONICS, INC.

DEI DATA CARTRIDGES

COMPATIIBLE WITH 3M

DEI	3M#	MB	Warranty	5-10	11-24	25+
400442	300XLP	45	1 YR	$17.90	$17.75	$17.50
400862	600A	60	1YR	$19.50	$19.25	$18.95
400903	N/A	60	1YR	$21.00	$21.00	$20.50
420866	600XTD	300	LIFETIME	$23.50	$23.00	$22.75
420862	600A	125	LIFETIME	$20.50	$20.25	$20.00
400910	2000	40	LIFETIME	$16.50	$16.40	$16.30
420442	300XLP	45	LIFETIME	$19.95	$19.75	$19.50

3M Data Cartridge Tapes

	5-10 TAPES	11-24	25+
DC100A	$11.70	$11.60	$11.50
DC300A	$15.40	$15.30	$15.25
DC300XLP	$18.30	$17.95	$17.75
DC600A	$20.45	$19.50	$19.25
DC600HC	$23.25	$23.10	$22.95
DC600XTD	$21.90	$21.90	$21.50
DC1000	$12.15	$12.10	$11.95
DC2000	$16.50	$16.40	$16.30

SALE

Cassette Tape

10-20 MB	$13.00
30-60 MB	$15.00

BERNOULLI CARTRIDGES

10MB TRIPACK	$190.00
20MB TRIPACK	$260.00

LOWEST DATA CARTRIDGE PRICES IN U.S.A.!!

CLEARANCE SPECIAL!

GRAHAM DC 600A $18.75 (Supplies Limited)

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USER PREFERRED BECAUSE EVERY TAPE IS 100% TESTED

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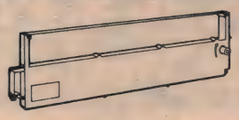
Ribbons



ALPS	6-23	24+
2000	$4.85	$4.60
ANADEX		
9500/9600	$3.95	$3.72
APPLE		
IMAGEWRITER	$3.15	$2.75
IMAGEWRITER 4 COLOR	$10.85	$10.30
SCRIBE	$$4.50	$4.25
BROTHER		
1509,1709	$5.65	$5.35
HR 15-35 MS	$4.15	$3.95
HR 15-35 NYLON	$3.95	$3.65
C. ITOH		
PROWRITER JR.	$6.00	$5.70
1550,7500,8500	$3.15	$3.35
3500	$16.00	$15.20
CENTRONICS		
150,152	$2..35	$2.25
350,351,352,353	$9.25	$8.75
704,705,753	$4.85	$4.60
CITIZEN		
120D,180D	$5.00	$4.75
MSP 10,20	$3.75	$3.55
MSP 15,25	$4.50	$4.25
PREMIER 35	$2.50	$2.35
COMMODORE		
MPS 801	$4.50	$4.25
MPS803	$4.75	$4.50
1525	$4.75	$4.50
1526	$5.00	$4.75
COMREX		
420	$7.50	$7.15
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M100,120,M200	$3.75	$3.55
B300,600	$5.40	$5.15
B900,1000	$7.05	$6.70
DATA ROYAL		
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180,220,5180	$2.75	$2.60
DIABLO		
HYTYPE II MS	$2.75	$2.35
HYTYPE II NYLON	$2.75	$2.35
610,620 MS	$3.50	$3.35
10,620 CORR	$3.00	$2.85
DIGITAL		
LA 30,36	$3.00	$2.85
LA 34,38,100	$3.00	$2.85
LA120, 180	$3.50	$3.35
EPSON		
AP-80	$3.75	$3.55
MX,RX,FX 80&85,LX800	$2.50	$2.35
MX,RX,FX 100 & 286	$3.50	$3.35
LX80,85 & 90	$2.65	$2.50
LQ800,850	$3.75	$3.55
LQ1000,1050	$4.85	$4.60
LQ2500	$4.85	$4.60
EX800,EX1000	$4.55	$4.30
FUJITSU		
DPMG9/DX2100-220	$4.25	$4.05
DPL2400,DL2400	$14.00	$13.30
GENICOM		
3000	$13.50	$12.80
HEWLWETT PACKARD		
2608	$20.45	$1.95
2631A	$11.95	$11.35
IBM		
PROPRINTER	$4.00	$3.80
PROPRINTER XL	$4.85	$4.60
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WHEELWRITER CORR	$3.45	$3.25
WHEELWRITER LOT	$2.15	$2.00
SELECTRIC II HY	$2.05	$1.95
3287/3615 SILVER$CUP	$1.85	$1.75
3287 SILVER $ CART.	$2.65	$2.50

IDS	6-23	24+
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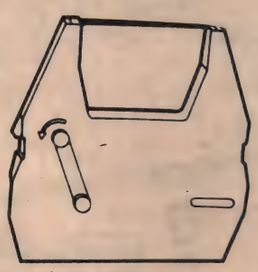
PRISM,COLOR	$10.65	$10.10
MANNESMAN TALLY		
MT 85	$3.95	$3.75
MT86	$4.50	$4.25
MT120, 160	$3.25	$3.05
MT140,180	$3.75	$3.55
NEC		
P2200	$5.95	$5.65
3500 MS	$4.00	$3.80
3500 MS FLIP	$6.00	$5.70
3500 NYLON	$3.75	$3.55
5500 MS	$3.25	$3.05
5500 NYLON	$2.70	$2.55
P2, P6	$3.85	$3.65
P3,P7	$4.00	$3.80
P5, P9	$4.25	$4.00
OKIDATA		
80,82,92	$1.25	$1.15
84	$2.75	$2.60
182,192	$4.25	$4.05
292	$4.90	$4.65
293,294	$6.05	$5.75
2350,2410	$14.00	$11.30
PANASONIC		
1080,1090,1092	$5.50	$5.20
RADIO SHACK		
III,IV	$3.75	$3.55
VI,VIII,DMP400	$3.15	$3.00
VII,DMP100	$4.25	$4.05
DMP110	$4.50	$4.25
DMP130	$3.75	$3.55
RICOH		
1300 MS	$3.25	$3.05
1300 NYLON	$3.75	$3.55
RITEMAN		
15	$7.50	$7.12
II, PLUS, INFORUNNER	$5.00	$4.75

SEIKOSHA	6-23	24+
BP 5200-5400	$12.00	$11.40
SL80AI,SP800,1000,1200	$3.75	$3.55
STAR		
GEMINI 10,15	$1.25	$1.15
RADIX 10	$3.85	$3.65
RADIX 15	$4.50	$4.25
NB15, NB24-15	$6.50	$6.15
NB10,NB10-24	$6.50	$6.15
NX10,NL10,NP10,ND10	$3.85	$3.64
NX15,ND15	$5.65	$5.35
SD10, DELTA 10	$4.05	$3.85
SD15,DELTA 15	$4.45	$4.25
NX1000	$5.35	$5.10
TEXAS INSTRUMENTS		
800,810	$3.50	$3.32
850,855	$3.40	$3.25
860,865	$3.50	$3.30
TOSHIBA		
P1340,P1350,	$3.35	$3.20
P321,P351	$3.35	$3.20
P321SL,P341SL,	$4.95	$4.70
345C	CALL	



CABLES

SALE

		1-9	10+
CC311-06	PC XT Modem Cable - 6 feet	$9.50	$7.50
CC311-10	PC XT Modem Cable - 10 feet	$10.75	$8.75
CC312-01	PC AT Modem Cable - 1 foot	$7.50	$5.50
CC312-06	PC AT Modem Cable - 6 feet	$9.50	$7.50
CC312-10	PC AT Modem Cable - 10 feet	$10.75	$8.75
CC313-06	RCA to RCA Male to Male - 6 feet	$3.20	$1.20
CC314-06	AT to Laser Plotter - 6 feet	$9.95	$7.95
CC314-10	AT to Laser Plotter - 10 feet	$11.25	$9.25
CC314-15	AT to Laser Plotter - 15 feet	$12.85	$10.85
CC315-06	XT to Laser Plotter - 6 feet	$9.95	$7.95
CC315-10	XT to Laser Plotter - 10 feet	$11.25	$9.25
CC315-15	XT to Laser Plotter - 15 feet	$12.85	$10.85
CC316-06	DB9 Male to Male (PC Monitor, etc.) - 6 feet	$9.95	$7.95
CC316-10	DB9 Male to Male (PC Monitor) - 10 feet (50†,	$11.25	$9.25
CC317-06	DB9 Male to Female (monitor ext, etc.) - 6 feet	$9.95	$7.95
CC317-10	DB9 Male to Female (monitor ext, etc.) - 10 ft	$11.25	$9.25
CC318-10	PC to RGB Monitor - 10 feet	$11.25	$9.25
CC319	PS2 to Multi-Sync Adapter (DB9 M to 15 pin M) - 6"	$11.25	$9.25
CC325	PC Disk Drive Power "Y" Cable	$5.75	$3.75
CC330-06	5 Pin Din Male to Fem (PC Keyboard ext) - 6 feet	$5.25	$3.25
CC331-06	PC AC Powercord - 6 feet	$4.95	$2.95
CC332-06	PC AC Power Extension - 6 feet	$4.95	$2.95
CC333 ‡	PC Extender Pack (1-CC317, 1-CC330, 1-CC332)	$11.95	$9.25
CC334-03	Monitor Power Adapter - 3 feet (50)	$5.25	$3.25
CC335-MM	Gender Changer - RS232 (DB25) - Male to Male	$7.75	$5.75
CC336-FF	Gender Changer - RS232 (DB25) - Fem to Fem	$7.75	$5.75
CC337-MF	Null Modem Adapter RS232 (DB25) - Male to Fem	$7.75	$5.75
CC338-06	Null Modem Cable- RS232- Male to Fem - 6'	$9.95	$7.95
CC338-10	Null Modem Cable - RS232 - Male to Fem - 10 ft	$11.25	$9.25
CC339	RJ11 Modem Surge & Spike Protector	$11.50	$9.50
CC340-MF	RS232 (DB25) Port Mini Tester	$11.50	$9.50
CC341-MF	RS232 (DB25) Port Surge Protector	$11.50	$9.50
CC342	RS232 (DB25) Male to RJ45 Adapter	$8.50	$6.50
CC343	RS232 (DB25) Female to RJ45 Adapter	$8.50	$6.50
CC345-06	Null Modem Cable RS232 Fem to Fem - 6 feet	$9.95	$7.95
CC346-MF	RS232 (DB25) Jumper Box	$8.50	$6.50
CC348-MM	DB9 Gender Changer Male to Male	$7.75	$5.75
CC349-FF	DB9 Gender Changer Female to Female	$7.75	$5.75
CC351-06	Null Modem Cable RS232 Male to Male - 6 feet	$9.95	$7.95
CC352-MM	Null Modem Adapter RS232 - Male to Male	$7.75	$5.75
CC353-FF	Null Modem Adapter RS232 - Female to Female	$7.75	$5.75
CC354-MM	Centronics Gender Changer Male to Male	$14.50	$12.50
CC355-FF	Centronics Gender Changer Female to Female	$14.50	$12.50
CC430	Coaxial Male to RJ11 Adapter (Balun)	$17.00	$15.00
CC431	Coaxial Female to RJ11 Adapter (Balun)	$17.50	$15.00
CC432	Twinaxial Male to RJ11 Adapter (Balun)	$28.00	$25.00
CC433	Twinaxial Female to RJ11 Adapter (Balun)	$28.00	$25.00
CC434	DB25 Male to RJ11 Adapter	$8.50	$6.50
CC435	DB25 Female to RJ11 Adapter	$8.50	$6.50
CC378-10	RJ11 Male to Male Cable - 10 feet	$4.50	$2.50
CC378-15	RJ11 Male to Male Cable - 40 feet	$6.75	$4.75
CC378-25	RJ11 Female to 4 Prong Male Adapter	$4.00	$2.00

		1-9	10+
CC300-06	Centronics Male to Male - 36 wire - 6 feet	$11.25	$9.25
CC300-10	Centronics Male to Male - 36 wire - 10 feet	$12.50	$10.50
CC301-06	Centronics Male to Male - 6 feet	$9.95	$7.95
CC301-10	Centronics Male to Male - 10 feet	11.25	$9.25
CC301-15	Centronics Male to Male - 15 feet	$13.75	$11.75
CC301-25	Centronics Male to Male - 25 feet	$19.75	17.75
CC301-35	Centronics Male to Male - 35 feet	$26.75	$23.75
CC301-40	Centronics Male to Male - 40 feet	$29.75	$26.75
CC301-50	Centronics Male to Male - 50 feet	$37.75	$32.75
CC302-06	Centronics Male to Female - 6 feet	$9.95	$7.95
CC302-10	Centronics Male to Female - 10 feet	$11.25	$9.25
CC302-15	Centronics Male to Female - 15 feet	$13.75	$11.75
CC302-25	Centronics Male to Female - 25 feet	$19.75	$17.75
CC302-50	Centronics Male to Female - 50 feet	$37.75	$32.75
CC303-06	Centronics Female to Female - 6 feet	9.95	$7.95
CC303-10	Centronics Female to Female - 10 feet	$11.25	$9.25
CC304-03	PC Parallel Printer Cable - 3 feet	$8.50	$6.50
CC304-06	PC Parallel Printer Cable - 6 feet	$8.50	$6.50
CC304-10	PC Parallel Printer Cable - 10 feet	$10.00	$8.00
CC304-15	PC Parallel Printer Cable - 15 feet	$13.75	$11.75
CC304-20	PC Parallel Printer Cable - 20 feet	$16.75	$14.75
CC304-25	PC Parallel Printer Cable - 25 feet	$19.75	$17.75
CC304-30	PC Parallel Printer Cable - 30 feet	$23.75	$20.75
CC304-35	PC Parallel Printer Cable - 35 feet	$26.75	$23.75
CC304-50	PC Parallel Printer Cable - 50 feet	$37.75	$32.75
CC304-100	PC Parallel Printer Cable - 100 feet	$69.75	$62.75
CC305-06	RS232 (DB25) Male to Male - 6 feet	$11.95	$9.95
CC305-10	RS232 (DB25) Male to Male - 10 feet	$11.25	$9.25
CC305-15	RS232 (DB25) Male to Male - 15 feet	$13.75	$11.75
CC305-20	RS232 (DB25) Male to Male - 20 feet	$16.75	$14.75
CC305-25	RS232 (DB25) Male to Male - 25 feet	$19.75	$17.75
CC305-35	RS232 (DB25) Male to Male - 35 feet	$26.75	$23.75
CC305-40	RS232 (DB25) Male to Male - 40 feet	$29.75	$26.75
CC305-50	RS232 (DB25) Male to Male - 50 feet	$35.75	$32.75
CC305-70	RS232 (DB25) Male to Male - 70 feet	$49.75	$44.75
CC305-75	RS232 (DB25) Male to Male - 75 feet	$52.75	$47.75
CC305-100	RS232 (DB25) Male to Male - 100 feet	$69.75	$62.75
CC306-06	RS232 (DB25) Male to Female - 6 feet	$9.95	$7.95
CC306-10	RS232 (DB25) Male to Female - 10 feet	$11.25	$9.25
CC306-15	RS232 (DB25) Male to Female - 15 feet	$13.75	$11.75
CC306-20	RS232 (DB25) Male to Female - 20 feet	$16.75	$14.75
CC306-25	RS232 (DB25) Male to Female - 25 feet	$19.75	$17.75
CC306-35	RS232 (DB25) Male to Female - 35 feet	$26.75	$23.75
CC306-40	RS232 (DB25) Male to Female - 40 feet	$29.75	$26.75
CC306-50	RS232 (DB25) Male to Female - 50 feet	$37.75	$32.75
CC306-70	RS232 (DB25) Male to Female - 70 feet	$49.75	$44.75
CC306-75	RS232 (DB25) Male to Female - 75 feet	$52.75	$47.75
CC306-100	RS232 (DB25) Male to Female - 100 feet	$69.75	$62.75
CC307-06	RS232 (DB25) Female to Female - 6 feet	$9.95	$7.95
CC307-10	RS232 (DB25) Female to Female - 10 feet	$11.25	$9.25
CC307-15	RS232 (DB25) Female to Female - 15 feet	$13.75	$11.75
CC307-25	RS232 (DB25) Female to Female - 25 feet	$19.75	$17.75
CC307-50	RS232 (DB25) Female to Female - 50 feet	$37.75	$32.75

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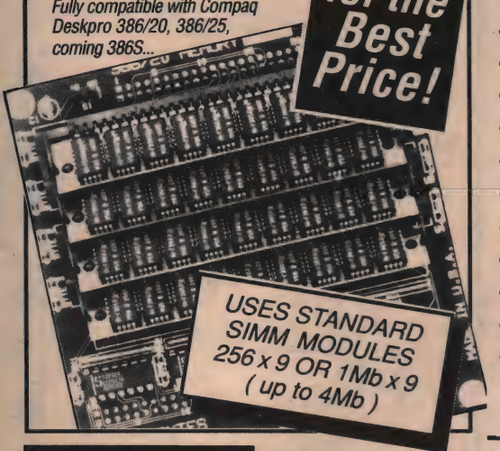

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SIMMS!

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41256 256k x			8.95
4125			
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4125			
4125			39.00
41256 256k	95	1 Mb x 1 ZIP, 100ns	39.00
41256 256k x 1, 80ns	12.95	1 Mb x 1 SOJ, 100ns	42.00
41256 256k x 1, 100ns	12.50	1 Mb x 1 PLCC, 100ns	42.00
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41256 256k x 1, 150ns	10.50	256k x 1 PLCC , 120ns	13.95
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80287-8	235.
80287-6	159.
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8087 (5 MHz)	99.
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80386-20	799.
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V-20 8 MHz	10.95
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6264-8kx8,150ns	9.95
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6116, 2kx8,150ns	7.95

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27C101 128kx8,250ns	22.95
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27C512 64kx8, 200ns	14.95
27512 200ns	13.95
27512 250ns	12.95
27C256 32kx8, 150ns	8.95
27C256 32kx8, 200ns	5.95
27256 150ns	8.95
27256 200ns	5.95
27256 250ns	5.50
27C128 250ns	5.95
27128A 16kx8, 150ns	8.95
27128A 16kx8, 200ns	5.75
27128A 16kx8, 250ns	4.95
27C64 8kx8, 150ns	5.95
27C64 8kx8, 200ns	4.95
2764 150ns	5.95
2764 200ns	4.95
2764 250ns	3.95
2732A 250ns	4.95
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80C31	5.95	81C55	4.95
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8035	2.39	8155	2.95
8039	2.49	8203	14.95
8049	1.95	8214	3.95
80C85A	3.95	8226	2.95
8085A	2.95	8237A-5	4.50
8086-2	5.95	82C51A	3.95
8086	4.95	8251A	2.95
8088-1	6.50	82C53-5	3.95
		8253-5	2.95
		82C55A-5	3.95

8255A-2	3.95		
8255A-5	2.95		
8259A	2.95		
8259C-5	2.95		
8279-5	3.95		
8283	3.95		
8284A	2.95		
8286	3.95		
8287	3.95		
8288	4.95		
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74F04	.35	74F158	.59	74F245	1.29
74F08	.35	74F160	.59	74F251	.79
74F10	.35	74F161	.59	74F258	.79
74F11	.35	74F163	.59	74F280	2.89
74F20	.35	74F174	.69	74F373	1.49
74F32	.35	74F175	.69	74F374	1.49
74F64	.49	74F181	1.99	74F379	1.99
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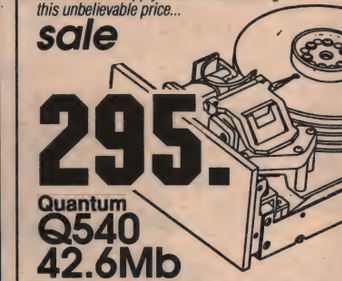

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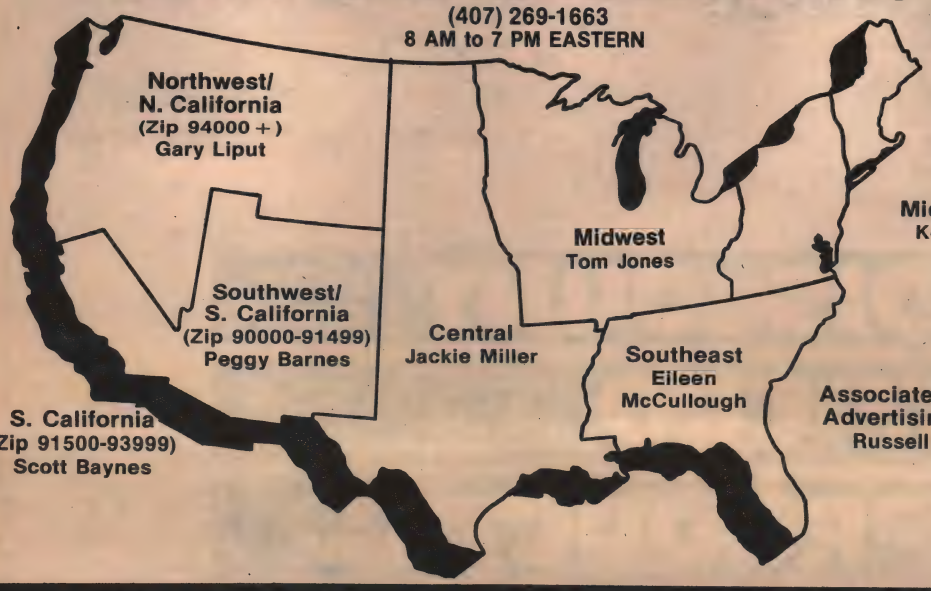

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Phone: (513)368-2309

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The Amstrad PCW 9512 is complete with letter quality daisywheel printer and software for all word processing operations. LocoScript word processing software has all the professional features you could want and it's quick and easy to learn. Another great feature, LocoSpell is an 80,000 word spell-checking dictionary. Mistakes never hit the paper. You can even add names or special words to it. In short, the PCW 9512 makes you a perfect speller.

To make your work look perfect, the PCW 9512 comes with a full-featured daisywheel printer. It has interchangeable daisywheels, built-in tractor and wide 15" paper carriage.

Although the PCW 9512 is principally a word processor, it can also be used as a general purpose computer. It will run a wide range of commercial software packages and accounts progams.

So whether you send the PCW 9512 with your college student, use it at home or benefit from its flexibility in the office . . . it's a word processing system that can't be beat at any price. And you get it all for less than $499.

Sincerely,

Mark Runkle

Mark L. Runkle
President

P.S. – The Amstrad PCW 9512 word processing system is the best deal to come along for a long time!

Amstrad PCW 9512

● Monitor ● Custom Keyboard
● Daisywheel Printer ● Software

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WD286 Motherboard

- Built-in Paradise EGA 640 x 480 resolution, 16 colors, EGA, CGA, MDA, and Hercules compatible
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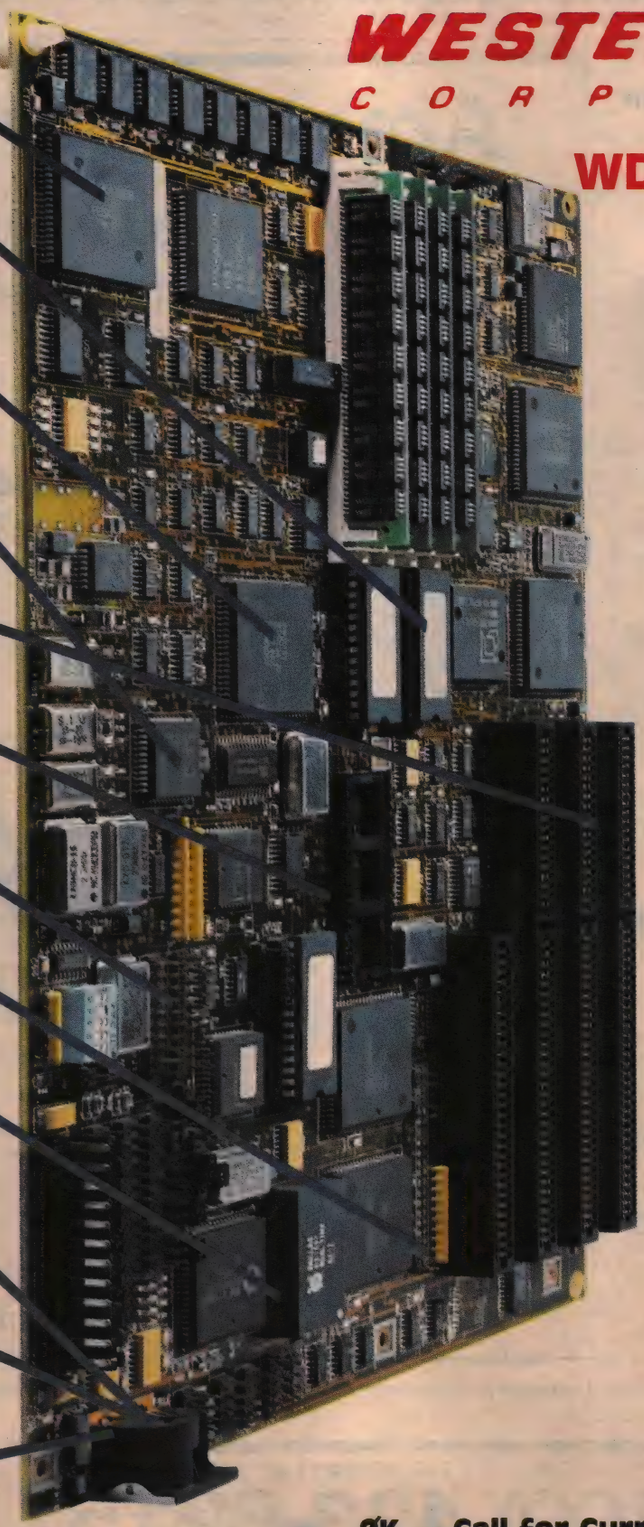

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The WD286 has a built-in Western Digital Hard Disk controller chip that supports 1 to 1 interleaving, increasing the speed and efficiency of your hard drive.

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- IBM CGA compatible
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The portable replacement for the desktop PC.

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- IBM EGA compatible
- MS-DOS 3.2
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Ultimate performance in a sleek, lightweight portable

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- 40MB hard disk drive
- 1.44MB 3½" disk drive
- 2MB memory
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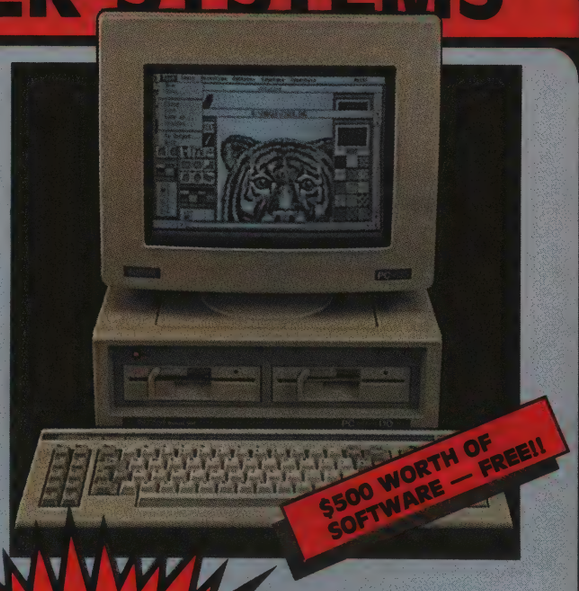

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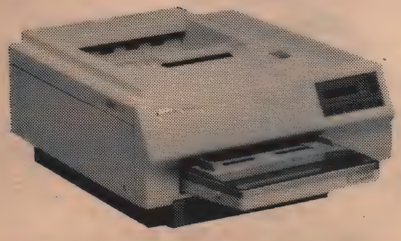

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Plugs into LaserJet II for 1.5MB total memory. Compatible with H.P. 1MB Memory Card.

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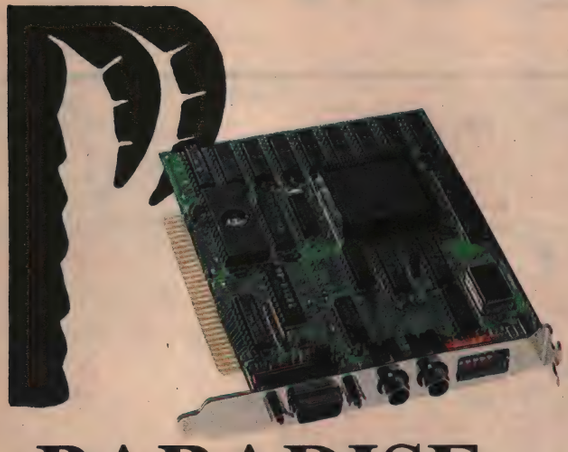

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- 100% compatible with IBM EGA standard
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Shades of Brilliance

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- Flicker-free scrolling

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High performance video for the IBM Standard

- Automatically reconfigures to graphics mode required by software in use
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- 640 x 480 resolution
- Allows 132 column text mode

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100% Faster than IBM VGA Card

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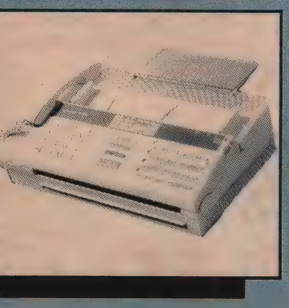
SHARP

FO-300



70 auto dialing numbers: 20 rapid dialing for frequently called numbers; 50 additional speed dialing numbers
18-second transmission
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Accepts documents up to 11" wide (FO-300 only)
Automatic document feeder (Max 10 sheets)
Automatic reduction
Automatic redialing
Confidential transmission and reception

FO300
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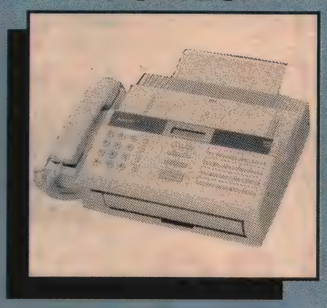
FO-420



SAME FEATURES AS THE FO-300 PLUS. . .
- Separate fax and phone autodialing lists. Each stores 70 numbers: 20 rapid dialing for frequently called numbers
- Contrast control ensures readability of copies from light originals or documents with dark-colored backgrounds
- Automatically cuts copies to length of originals

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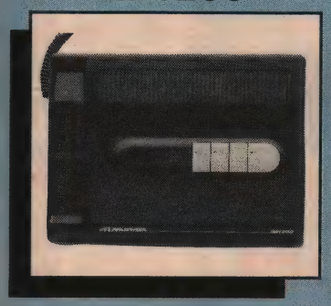
Determined To Be Number One.

M-1200



- Receive documents unattended
- Share fax and phone functions on a single telephone
- Convenience of a desk-top photocopier at no extra cost
- G2 & G3 compatible
- 2 transmitting modes: normal and fine
- Advanced polling features
- Automatic record keeping

FX-M1200
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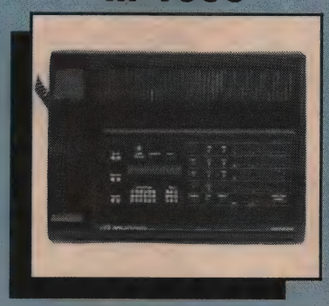
M-1600



SAME FEATURES AS THE M-1200 PLUS. . .
- Store 30 frequently used numbers: 16 speed dial, 14 one-touch numbers
- 4 digit password to pre-unauthorized polling of sensitive documents
- 32-character display to guide you through each function mode

FX-M1600
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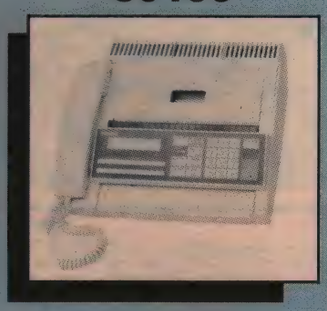
TOSHIBA

30100



- Sends and receives documents in as little 15 seconds
- One touch operation
- Speed dial memory for up to 50 fax numbers and 50 phone numbers
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- Last Number redial

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SAME FEATURES AS THE 30100 PLUS. . .
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- Speed dial memory for 30 fax and 30 phone numbers
- Advanced polling features
- Contrast control

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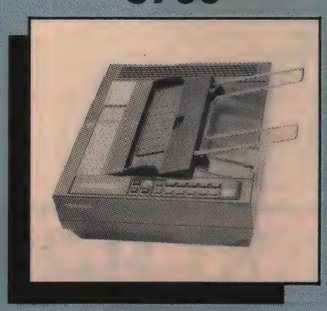
3700



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D1-STM .....

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with Error Correction Level 4

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D1-TIDBIT24 .....

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- Includes communication software
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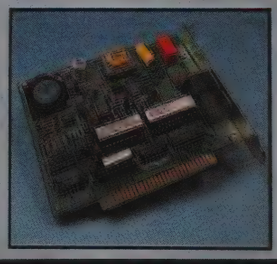
D1-24I .....



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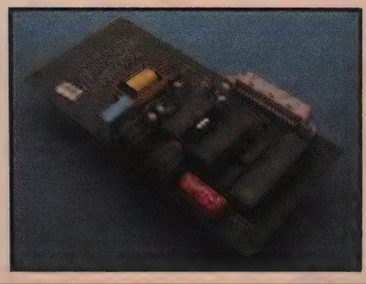
NEC MUTLISPEED: Models EL & ND
ZENITH: Models Z181 & Z183
SHARP: Models 4501 & 4502

$229



4800 BPS

"desktalk 48"
External Modem

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- Error correction level 5 allows increased speed due to data compression
- Includes communication software
- 5 year warranty

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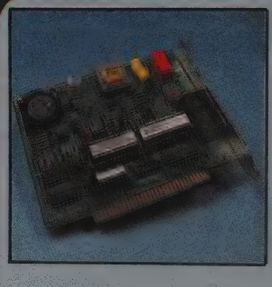
D1-48DTM .....



"smalltalk 48"
Internal Modem

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- Error correction level 5 allows increased speed due to data compression
- Includes communication software
- 5 year warranty

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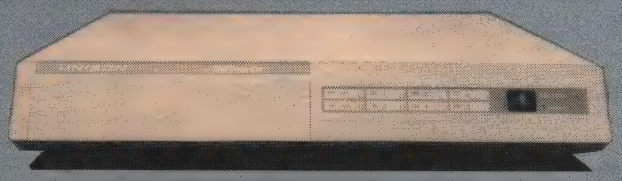
UNISON 600 Uninterruptable Power Supply

What You Expect in a UPS system and MORE!



Unison Technologies, Inc has designed this power system with the single concept in mind: **Your PCs and your PC data are too valuable to leave unprotected any longer.**

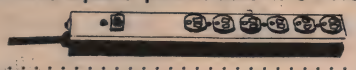
The Unison 600 features: remote-on capabilities, 8 peripheral plug-ins, a telephone surge surpressor, a recessed light bar which illuminates the keyboard for you to finish your work in the dark, and most importantly, the assurance of continuous power — not "stand-by power" like most inexpensive UPS systems. The total power available is 1400VA. The Unison UPS systems fit between the monitor and the PC saving you space at your workstation.

D1-UNISON6 . . . . . **$599**

800 WATT AND 1000 WATT systems also available

6-OUTLET SURGE PROTECTOR

15 amp. fused circuit breaker with reset feature. 3 wire grounded outlets with surge and spike protection. 6' heavy duty line cord.



D1-6OUTSP **$8.95**

MINI CENTER POWER SUPPLY

5 control switches: computer, monitor, printer, aux. 1 & 2 plus a master power switch. Overload protection. Resetable 15 amp circuit breaker switch.

D1-MINICTR **$49.95**

THE NO-SLOT CLOCK

NEW

by Systems Manufacturing Technology, Inc

Uses a PROM socket freeing a slot on your computer!

Dual embedded lithium batteries maintain time in excess of 10 years. Operates with IBM-DOS, MS-DOS, Apple Pro-DOS, Apple DOS 3.3 and Appleworks,

D1-NOSLOT **$39.95**

LIQUIDATION SPECIALS

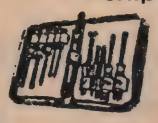
Quantities Limited ★ All Sales Final

SYSGEN 60 MB Tape Backup System
D1-SY60I-Q **$579**

SOFTWARE STARTER KIT PACKAGE Incl.:Word Processing, Spread-sheet, and Database.
STARTER KIT **$9.95**

PC TOOLKIT

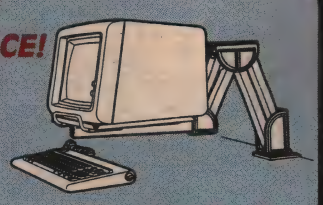
Contains 8 pieces including a Chip Inserter



D1-TOOLKIT . . **$14.95**

CRT VALET

SAVE DESKTOP SPACE!



- Holds monitors up to 75 lbs.
- Base rotates 360°
- Flexible tube inside arm hides cables and prevents tangles
- Wall, desk or flange mount

365020 **Desk Mount**
365021 **Wall Mount**
365022 **Flange Mount** **$89**

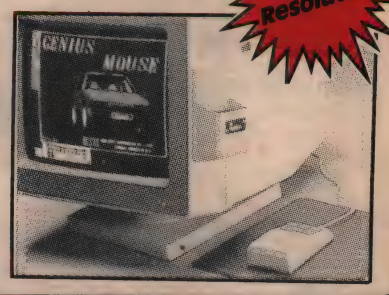
Genius® Mouse

Dyna Mouse

With Dr. Halo III

New Higher Resolution

Includes GM-6 Mouse, menu maker and library, pocket, pad, cutting board and Dr. Halo III, with which you can create stunning graphics. For CGA, EGA, Hercules, PGA and VGA displays



D1-MOUSEPLUS **$59**

CABLES & SWITCHES

6' PC/AT to Parallel Printer
F1-6SRPRMM **$11.95**
6' Par/Par or Cent/Cent
F1-6PRPRMM **11.95**
6' Modem Serial 25-pin M/F
F1-6SR25MF **11.95**
6' Serial 25-pin M/M
F1-6SR25MM **11.95**
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F-MC7041-5 . . . . . **11.95**
6' PC Keyboard Extension
F-MC0055-10 . . . . . **11.95**

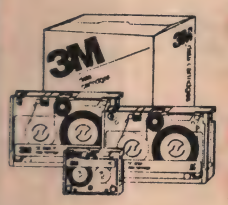
Parallel A/B Switch
D1-2-PAR **$18.50**
Parallel 4-Position Switch
D1-4-PAR **26.00**
Serial A/B Switch
D1-2-SER **16.50**
Serial 4-Position Switch
D1-4-SER **22.00**

SPECIAL!
Cables only **$9.95** with Switch purchase

DATA CARTRIDGES

3M

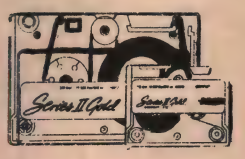
Sold in Tens



DC2000	*5-DC2000*	**$17.49**
DC1000	*5-DC1000*	**$13.75**
DC600A	*5-DC600-A*	**$21.95**
DC600HC	*5-DC600-HC*	**$23.49**
DC600XTD	*5-DC600XTD*	**$29.95**
DC300XLP	*5-DC300-XLP*	**$19.95**

DEI

Sold in Tens



DEI 300XLP	*5-400442*	**$18.55**
DEI 600A	*5-400862*	**$20.15**
DEI 600XTD	*5-420866*	**$24.95**

SONY

QD 600A	*5-DC600-A*	**$19.99**
QD 2000	*5-DC2000-S*	**$17.49**

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KAO

100 years of leadership in surface science technology goes into every **KAO** diskette — from raw materials to final packaging.

You can be assured that every **KAO** diskette exceeds all world-wide industry standards. (Pronounced like COW)

Boxed in Tens	100+	400+
3½" High Density, boxed *1K37A11*	3.59	3.49
3½" DS/DD, boxed *1K38A12*	1.49	1.45
3½" SS/DD, boxed *1K36A12*	1.19	1.15
3½" DS/DD, Rainbow pack 5 colors per clear plastic box *1K38A11-RB*	1.64	1.54

BULK
Packaged in 50's

3½" DS/DD, bulk *1K38A13*	1.14	1.09

Diskette labels **5¢** each, minimum 100

Diskaroo *MicroDisk Travel Pack*

Protect Your Data When You Travel

Rugged, water-resistant, anti-static nylon storage pack contains 10 KAO 1MB 3.5" MicroDisks. Fits in briefcase, school bag or purse. Velcro closures. Extra padding protects diskettes. 4 snug pouches keep diskettes organized.

1K38A11-DA ..... Retail Price $44.95/Pack **$19.50**

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Includes: envelopes, labels and write protect tabs.
Veriflex disks are 100% error-free

BULK 5¼" DS/DD **26¢** each 10000+ *1V55A19*

27¢, ea., 5000+ **29¢** ea., 1000+ **34¢** ea., 500+ **38¢** ea., 100+

WHITE BOX 5¼" DS/DD **32¢** each 10,000+ *1V55A11-W*

34¢ea., 5,000+ **38¢** ea., 1,000+ **40¢**ea., 500+ **43¢** ea., 100+

PLASTIC CASE 5¼" DS/DD **57¢** ea., 500+ *1X55A11*

Boxed in Tens **59¢** ea., 100+

WHITE BOX 5¼" HD **75¢** ea., 1000 *1K57A11*

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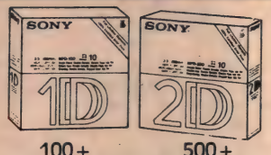
HURRY — Limited Quantity on this item!

3M

	100+	500+
5¼" DS/DD *1Q55A11*	.79	.69
5¼" HIGH DENSITY *1Q57A11*	1.59	1.45

SONY



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3½" DS/DD *1G38A12*	1.59	1.57
5¼" DS/DD *1G55A11*	.89	.79
5¼" DS/HD *1G57A11*	1.69	1.59

SONY BULK

	100+	400+
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Sony Labels **5¢** each, minimum 100

SONY HIGH DENSITY

	30+	100+
3½" High Density, boxed *1G37A11*	4.59	4.39

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	100+	500+
5¼" DS/DD, boxed *1A55A11*	.75	.69
5¼" DS/HD, boxed *1A57A11*	1.49	1.39

Nashua

" You're 10 Minutes Ahead the Moment You Open the Box!"

Boxed in tens

	100+	500+
5¼" DS/DD Preformatted for DOS 2.0 and up. *1L55A11*	.57	.55
5¼" DS/HD *1L57A11*	1.19	1.09
8" DS/DD *1L85B31-1*	1.39	1.29

5¼" DS/DD, bulk *1M55A14*	.43	.39

Bulk includes envelopes, write protect tabs and labels

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(Orders only please)
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Minimum order $100. MasterCard and Visa not billed until order is shipped. No surcharge on MasterCard or Visa.

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USA★FLEX COMPUTER TAPE

			PART NO.	10-90	100+
BASF	ENDURA 2400' with Seals		525JW	11.95	11.50
	QUALIMETRIC GOLD 2400' with Seals		527JW	12.50	11.95
3M Black Watch™	3600' Tape with Seals		700MW	19.25	18.75
	2400' Tape with Seals		700JW	13.95	13.50
	2400' Tape with EZ Load II		700JR	13.50	12.95
MEMOREX	MRX V 3600' Tape with Seals		638MW	19.25	18.75
	MRX V 2400' Tape with Seals		635JW	12.50	11.95
	MRX V 2400' Tape with EZ Load II		635JR	12.95	12.50
	QUANTUM HD 2400' Tape with Seals		637JW	13.75	13.25
DECADE II	2400' Tape with Seals		850JW	10.95	10.50
	2400' Tape with EZ Load II		850JR	11.45	10.95

Shorter length tapes available

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COMPANY _____

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CITY _____ STATE _____ ZIP _____

( ) _____

AREA CODE PHONE NUMBER

2. SHIP TO.

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COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

( ) _____

AREA CODE PHONE NUMBER

3. INDICATE METHOD OF PAYMENT (Sorry, No C.O.D.'s Accepted)

☐ Check or Money Order. (Make checks payable to USA★*FLEX*. Orders paid by check will be held two weeks until check clears.)

☐ Purchase Order Number _____ ☐ Reseller # _____

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4. PLEASE PRINT CLEARLY AND FILL IN ALL COLUMNS

PAGE NO.	PART NUMBER	DESCRIPTION OF ITEM	QUANT.	PRICE EACH	EXTENSION
	REBATE	**$5.00 OFF ON MAIL-IN ORDER**	**1**		**– $5.00**

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1-800-872-3539

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Minimum order $100. All shipments are made by UPS ground.

For faster service, FAX the order form — 312-351-7204. *Please print clearly.*

Thank you for your order!!

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Ship./hand. (add 5% to total)	
TOTAL	

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STATIC RAMS

PART	SIZE	SPEED	PRICE
2112	256x4	450ns	2.99
2114	1024x4	450ns	.99
2114L-2	1024x4	200ns	1.49
TC5516	2048x8	250ns	3.95
TMM2016-200	2048x8	200ns	3.25
TMM2016-150	2048x8	150ns	3.29
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HM6116-2	2048x8	120ns	6.45
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HM6116LP-3	2048x8	150ns	6.45
HM6116LP-2	2048x8	120ns	6.95
HM6264LP-15	8192x8	150ns	9.95
HM6264LP-12	8192x8	120ns	10.95
HM43256LP-15	32768x8	150ns	12.95
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HM43256LP-10	32768x8	100ns	19.95

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PART	SIZE	SPEED	PRICE
4116-200	16384x1	200ns	.89
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MK4332	32768x1	200ns	6.95
4164-150	65536x1	150ns	2.89
4164-120	65536x1	120ns	3.19
4164-100	65536x1	100ns	3.95
TMS4164	65536x1	150ns	2.89
TMS4416	16384x4	150ns	8.95
41128-150	131072x1	150ns	5.95
TMS4464-15	65536x4	150ns	10.95
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41256-150	262144x1	150ns	12.45
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41256-100	262144x1	100ns	13.45
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1 MB-120	1048576x1	120ns	34.95
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2716	2048x8	450ns	25V	3.49
2716-1	2048x8	350ns	25V	3.95
2732	4096x8	450ns	25V	3.95
2732A	4096x8	250ns	21V	3.95
27C64	8192x8	250ns	12.5V	4.95
2764	8192x8	450ns	12.5V	3.49
2764-250	8192x8	250ns	12.5V	3.69
2764-200	8192x8	200ns	12.5V	4.25
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27128	16384x8	250ns	12.5V	4.95
27128A-200	16384x8	200ns	12.5V	5.95
27C256	32768x8	250ns	12.5V	7.95
27256	32768x8	250ns	12.5V	5.95
27256-200	32768x8	200ns	12.5V	7.95
27512	65536x8	250ns	12.5V	11.95
27C512	65536x8	250ns	12.5V	12.95
27C101-20	131072X8	200ns	12.5V	34.95

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8156	2.95
8155-2	3.95
8741	9.95
8742	29.95
8748	7.95
8749	9.95
8755	14.95
80286	79.95
80286-8	249.95

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8205	3.29
8212	1.49
8216	1.49
8224	2.25
8228	2.25
8237	3.95
8237-5	4.75
8238	4.49
8243	1.95
8250	6.95
8251	1.29
8251A	1.69
8253	1.59

8200

8253-5	1.95
8254	2.79
8255	1.49
8255-5	1.59
8256	15.95
8259	1.95
8259-5	2.29
8272	4.39
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8279	2.49
8279-5	2.95
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8283	3.95
8284	2.25
8286	3.95
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8288	4.95

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74LS01	.18	74LS122	.45	74LS242	.69
74LS02	.17	74LS123	.49	74LS243	.69
74LS03	.18	74LS124	2.75	74LS244	.69
74LS04	.16	74LS125	.39	74LS245	.79
74LS05	.18	74LS126	.39	74LS251	.49
74LS08	.18	74LS132	.39	74LS253	.49
74LS09	.18	74LS133	.49	74LS257	.39
74LS10	.16	74LS136	.39	74LS258	.49
74LS11	.22	74LS138	.39	74LS259	1.29
74LS12	.22	74LS139	.39	74LS260	.49
74LS13	.26	74LS145	.99	74LS266	.39
74LS14	.39	74LS147	.99	74LS273	.79
74LS15	.26	74LS148	.99	74LS279	.39
74LS20	.17	74LS151	.39	74LS280	1.98
74LS21	.22	74LS153	.39	74LS283	.59
74LS22	.22	74LS154	1.49	74LS290	.89
74LS27	.23	74LS155	.59	74LS293	.89
74LS28	.26	74LS156	.49	74LS299	1.49
74LS30	.17	74LS157	.35	74LS322	3.95
74LS32	.18	74LS158	.29	74LS323	2.49
74LS33	.28	74LS160	.29	74LS365	.39
74LS37	.26	74LS161	.39	74LS367	.39
74LS38	.26	74LS162	.49	74LS368	.39
74LS42	.39	74LS163	.39	74LS373	.79
74LS47	.75	74LS164	.49	74LS374	.79
74LS48	.85	74LS165	.65	74LS375	.95
74LS51	.17	74LS166	.95	74LS377	.79
74LS73	.29	74LS169	.95	74LS390	1.19
74LS74	.24	74LS173	.49	74LS393	.79
74LS75	.29	74LS174	.39	74LS541	1.49
74LS76	.29	74LS175	.39	74LS624	1.95
74LS83	.49	74LS191	.49	74LS640	.99
74LS85	.49	74LS192	.69	74LS645	.99
74LS86	.22	74LS193	.69	74LS670	.89
74LS90	.39	74LS194	.69	74LS682	3.20
74LS92	.49	74LS195	.69	74LS688	2.40
74LS93	.39	74LS196	.59	74LS783	22.95
74LS95	.49	74LS197	.59	25LS2521	2.80
74LS107	.34	74LS221	.59	26LS31	1.95
74LS109	.36	74LS240	.69	26LS32	1.95

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TL074	1.95	LM386	.89	LM2917	1.95
TL081	.59	LM393	.45	CA3046	.89
TL082	.99	LM394H	5.95	CA3146	1.29
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LM311	.59	NE556	.49	LM3900	.49
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LM311K	3.49	NE564	1.95	LM3911	2.25
LM312H	1.75	LM565	.95	LM3914	1.89
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LM319	1.25	NE570	2.95	MC4044	3.99
LM323K	3.49	NE590	2.50	RC4136	1.25
LM324	.34	NE592	.98	RC4558	.69
LM331	3.95	LM723	.49	LM1360	1.49
LM334	1.19	LM733	.98	75107	1.49
LM335	1.79	LM741	.29	75108	1.49
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LM339	.59	MC1350	1.19	75154	1.95
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LF353	.59	LM1488	.49	75189	1.25
LF356	.99	LM1489	.49	75451	.39
LF357	.99	LM1496	.85	75452	.39
LM358	.59	ULN2003	.79	75477	1.29

HIGH SPEED CMOS LOGIC

74HC00	.21	74HC244	.85	74HCT138	.35
74HC04	.25	74HC245	.85	74HCT139	.55
74HC08	.25	74HC273	.69	74HCT157	.59
74HC14	.35	74HC367	.69	74HCT161	.79
74HC32	.35	74HC373	.69	74HCT240	.89
74HC74	.35	74HC390	.79	74HCT244	.89
74HC138	.45	74HC374	.69	74HCT245	.99
74HC139	.45	74HC4040	.89	74HCT273	.99
74HC154	1.09	74HCT00	.25	74HCT373	.99
74HC157	.55	74HCT04	.27	74HCT374	.99
74HC161	.65	74HCT08	.25	74HCT393	.99
74HC164	.65	74HCT32	.27	74HCT4040	.99
74HC175	.59	74HCT74	.45	74HCT4060	1.49

STANDARD CMOS LOGIC

4001	.19	4028	.65	4069	.19
4011	.19	4040	.69	4070	.29
4013	.35	4042	.59	4081	.22
4015	.29	4044	.69	4093	.49
4016	.29	4046	.69	14411	9.95
4017	.49	4047	.69	14433	14.95
4018	.69	4049	.29	14497	6.95
4020	.59	4050	.29	4503	.49
4021	.69	4051	.69	4511	.69
4023	.25	4052	.69	4518	.85
4024	.49	4053	.69	4528	.79
4025	.25	4060	.69	4538	.95
4027	.39	4066	.29	4702	9.95

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7400	.19	74123	.49	74S00	.29
7402	.19	74125	.45	74S02	.29
7404	.19	74150	1.35	74S04	.29
7406	.29	74151	.55	74S08	.35
7407	.29	74153	.55	74S10	.29
7408	.24	74154	1.49	74S32	.35
7410	.19	74157	.55	74S74	.49
7411	.25	74159	1.65	74S86	.35
7414	.49	74161	.69	74S112	.50
7416	.25	74164	.85	74S124	2.75
7417	.25	74166	1.00	74S138	.79
7420	.19	74175	.89	74S153	.79
7430	.19	74367	.65	74S157	.79
7432	.29			74S158	.95
7438	.29	74F/74S		74S163	1.29
7442	.49	74F00	.35	74S175	.79
7445	.69	74F02	.35	74S195	1.49
7447	.89	74F04	.35	74S240	1.49
7473	.34	74F08	.35	74S241	1.49
7474	.33	74F10	.35	74S244	1.49
7475	.45	74F32	.35	74S280	1.95
7476	.35	74F64	.55	74S287	1.69
7483	.50	74F74	.39	74S288	1.69
7485	.59	74F86	.55	74S299	2.95
7586	.35	74F138	.79	74S373	1.69
7489	2.15	74F139	.79	74S374	1.69
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7493	.35	74F157	.89	74S571	2.95

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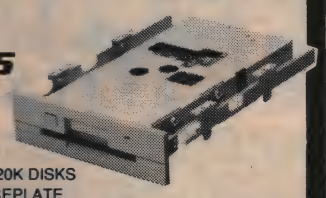

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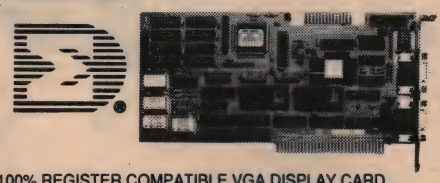

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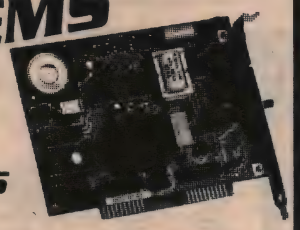

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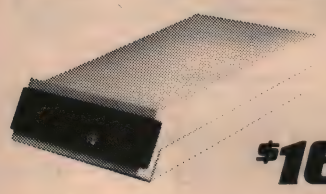

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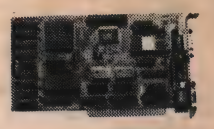

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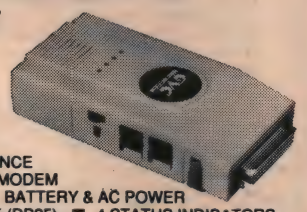

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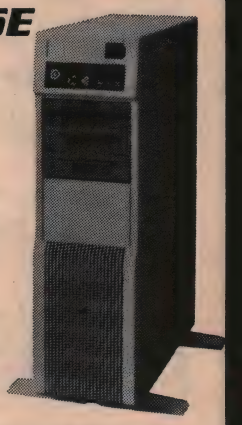

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CAPACITORS

TANTALUM			ELECTROLYTIC		
1.0µf	15V	.12	*RADIAL*		
6.8	15V	.42	1µf	50V	.14
10	15V	.45	4.7	50V	.11
22	15V	.99	10	50V	.11
1.0µf	35V	.45	47	35V	.13
2.2	35V	.19	100	16V	.15
4.7	35V	.39	100	50V	.23
10	35V	.69	220	35V	.20
			470	25V	.30
DISC			2200	16V	.70
			4700	25V	1.45
10pf	50V	.05			
22	50V	.05	*AXIAL*		
33	50V	.05	1µf	50V	.14
47	50V	.05	10	16V	.14
100	50V	.05	10	50V	.16
220	50V	.05	22	16V	.14
.001µf	50V	.05	47	50V	.19
.005	50V	.05	100	35V	.19
.01	50V	.07	470	50V	.29
.05	50V	.07	1000	16V	.29
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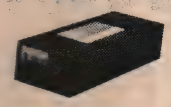
PS-A $49.95



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PS-ASTEC $24.95

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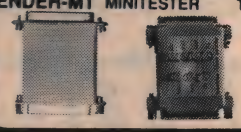

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DESCRIPTION	ORDER BY	CONTACTS					
		10	20	26	34	40	50
SOLDER HEADER	IDHxxS	.82	1.29	1.68	2.20	2.58	3.24
RIGHT ANGLE SOLDER HEADER	IDHxxSR	.85	1.35	1.76	2.31	2.72	3.39
WIREWRAP HEADER	IDHxxW	1.86	2.98	3.84	4.50	5.28	6.63
RIGHT ANGLE WIREWRAP HEADER	IDHxxWR	2.05	3.28	4.22	4.45	4.80	7.30
RIBBON HEADER SOCKET	IDSxx	.63	.89	.95	1.29	1.49	1.69
RIBBON HEADER	IDMxx	--	5.50	6.25	7.00	7.50	8.50
RIBBON EDGE CARD	IDExx	.85	1.25	1.35	1.75	2.05	2.45
10' PLASTIC RIBBON CABLE	RCxx	1.60	3.20	4.10	5.40	6.40	7.50

FOR ORDERING INSTRUCTIONS, SEE D-SUBMINIATURE CONNECTORS BELOW

D-SUBMINIATURE CONNECTORS

DESCRIPTION		ORDER BY	CONTACTS					
			9	15	19	25	37	50
SOLDER CUP	MALE	DBxxP	.45	.59	.69	.69	1.35	1.85
	FEMALE	DBxxS	.49	.69	.75	.75	1.39	2.29
RIGHT ANGLE PC SOLDER	MALE	DBxxPR	.49	.69	--	.79	2.27	--
	FEMALE	DBxxSR	.55	.75	--	.85	2.49	--
WIREWRAP	MALE	DBxxPWW	1.69	2.56	--	3.89	5.60	--
	FEMALE	DBxxSWW	2.76	4.27	--	6.84	9.95	--
IDC RIBBON CABLE	MALE	IDBxxP	1.39	1.99	--	2.25	4.25	--
	FEMALE	IDBxxS	1.45	2.05	--	2.35	4.49	--
HOODS	METAL	MHOODxx	1.05	1.15	1.25	1.25	--	--
	PLASTIC	HOODxx	.39	.39	--	.39	.69	.75

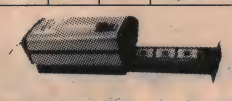
ORDERING INSTRUCTIONS:
INSERT THE NUMBER OF CONTACTS IN THE POSITION MARKED "xx" OF THE "ORDER BY" PART NUMBER LISTED. EXAMPLE : A 15 PIN RIGHT ANGLE MALE PC SOLDER WOULD BE DB15PR.

MOUNTING HARDWARE 59¢

EPROM ERASERS

SPECTRONICS CORPORATION

Model	Timer	# of Chips	Intensity (uW/Cm²)	Unit Cost
PE-140	NO	9	8,000	$ 89
PE-140T	YES	9	8,000	$139
PE-240T	YES	12	9,600	$189



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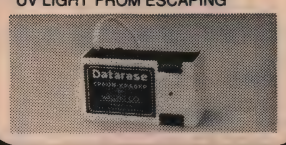

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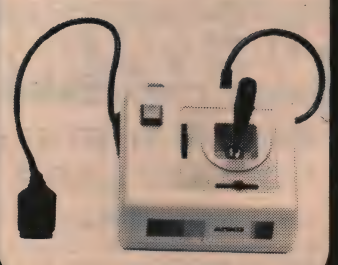


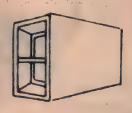
IC SOCKETS/DIP CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS								
		8	14	16	18	20	22	24	28	40
SOLDERTAIL SOCKETS	xxST	.11	.11	.12	.15	.18	.15	.20	.22	.30
WIREWRAP SOCKETS	xxWW	.59	.69	.69	.99	1.09	1.39	1.49	1.69	1.99
ZIF SOCKETS	ZIFxx	--	4.95	4.95	--	5.95	--	5.95	6.95	9.95
TOOLED SOCKETS	AUGATxxST	.62	.79	.89	1.09	1.29	1.39	1.49	1.69	2.49
TOOLED WW SOCKETS	AUGATxxWW	1.30	1.80	2.10	2.40	2.50	2.90	3.15	3.70	5.40
COMPONENT CARRIERS	ICCxx	.49	.59	.69	.99	.99	.99	.99	1.09	1.49
DIP PLUGS (IDC)	IDPxx	.95	.49	.59	1.29	1.49	--	.85	1.49	1.59

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE CONNECTORS ABOVE

SHORTING BLOCKS

5/$1.00



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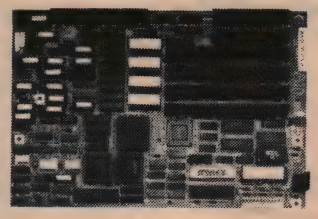

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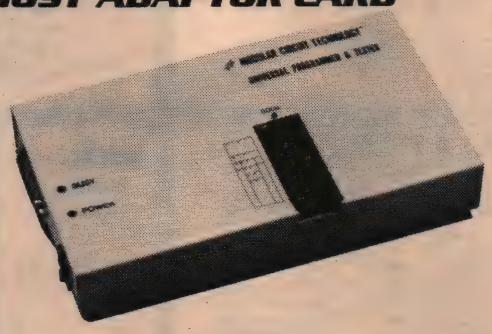

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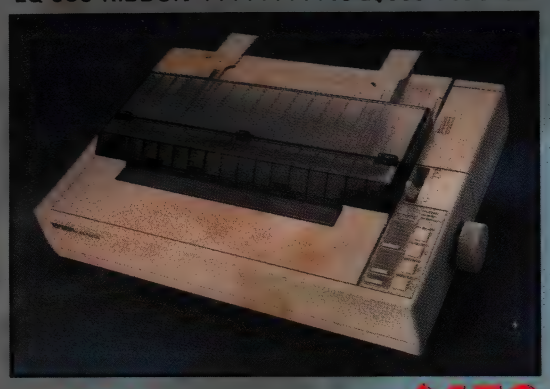

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FX-850 ..... *B1-FX850* **$348**
FX-850 RIBBON ..... *15-FX850* **6.60 ea**

FX-1050 ..... *B1-FX1050* **$498**
FX-1050 RIBBON ..... *15-FX1050* **10.95 ea.**

LQ-500 ..... *B1-LQ500* **$329**
LQ-500 RIBBON ..... *15-IP496* **3.25 ea.**

LQ-850 ..... *B1-LQ850* **$529**
LQ-850 RIBBON ..... *15-IP496* **3.35 ea.**

LQ-1050 ..... *B1-LQ1050* **$719**
LQ-1050 RIBBON ..... *15-IP497* **4.25 ea.**

LX-800 ..... *B1-LX800* **$189**
LX-800 RIBBON ..... *15-IP492* **3.15 ea.**

EX-800 ..... *B1-EX800* **$441**
EX-800 RIBBON ..... *15-IP498* **4.35 ea.**

PRINTER ENHANCEMENTS

EX-800 Color Option Kit 8391PA	$72
FX-286e Cut Sheet Feeder 8348	$153
Scanner for EX-800 8392W	$248
Universal Serial Board 8148	$117
Printer Stand	$14.95

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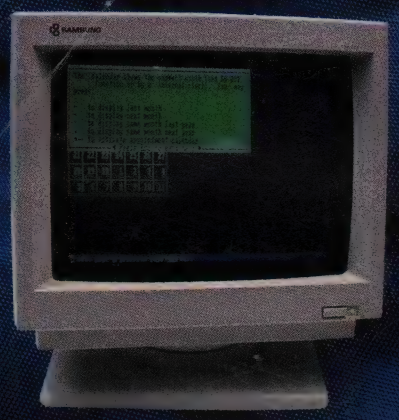

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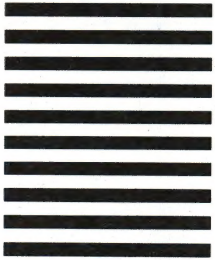

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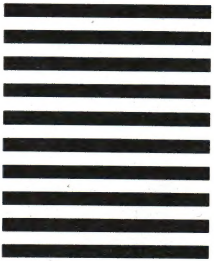

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